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ABSTRACT

The results of the second 18 months (December 15, 1968-June 30, 1970) of effort toward developing an Information Processing Laboratory for research and education in library science is reported in six volumes. This volume contains: the rationale and description, definitions, index and coding key, retrieval procedures, and examples. This manual is intended as an explication of the REFSEARCH system as implemented in the Information Processing Laboratory. Part II of the manual gives the rationale of the REFSEARCH system. Part III defines the terms used in "REFSEARCH language." Examples are given in Part VI to show how "handles" are identified and converted into channel entry terms, and how other elements of a search specification are assembled. (Other volumes of this report are available as LI 003607, LI 003608, LI 003610 and LI 003611). (Author/NH)

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FINAL REPORT
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REFERENCE SEARCH SYSTEM (REFSEARCH) USERS' MANUAL

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FOREWORD

This report contains the results of the second 18 months (December 15, 1968 - June 30, 1970) of effort toward developing an Information Processing Laboratory for research and education in library science. The work was supported by a grant (OEG-1-7-071085-4286) from the Bureau of Research of the Office of Education, U.S. Department of Health, Education, and Welfare and also by the University of California. The principal investigator was M.E. Maron, Professor of Librarianship, University of California, Berkeley.

This report is being issued as five separate volumes by the Institute of Library Research, University of California, Berkeley. These five volumes are:

Maron, M.E. and Don Sherman, et al. An Information Processing Laboratory for Education and Research in Library Science: Phase 2.

Contents--Introduction and Overview; Development of an Educational Facility; Operational Experience.

Mignon, Edward, Irene Travis and Arjun Aiyer. LABSEARCH (Associative Search System) and CIMARON (MARC II Search System) Users' Manuals.

LABSEARCH Contents--Basic Operating Instructions; Commands; Scoring Measures of Association; Subject Authority List.
CIMARON Contents--Data Base Selection; Entering Search Requests; Search Results; Record Retrieval Controls; Data Base Generation.

Meredith, Joseph M. REFSEARCH (Reference Search Users' Manual).

Contents--Rationale and Description; Definitions; Index and Coding Key; Retrieval Procedures; Examples.

Silver, Stephen S. and Joseph C. Meredith. DISCUS Interactive System Users' Manual.

Contents--Basic On-Line Interchange; DISCUS Operations; Programming in DISCUS; Concise DISCUS Specification; System Author Mode; Exercises.

Smith, Stephen F. TMS (Terminal Monitor System) Users' Guide.

Contents--System Conventions; Specifications for Coding TMS Macros; Top-Level Control Language.

ACKNOWLEDGMENTS

Many individuals - students, faculty, and Institute staff - helped create the REFSEARCH system as it now stands. Among these, Mrs. Mary Whouley and Mrs. Edith Darknell made notable contributions to the original concept. Howard White defined the categorical elements and the descriptors linked with them, and undertook the immense task of analyzing a portion of the Library School Reference Collection according to the same special terms. Mr. White's analysis formed the basis for the REFSEARCH machine file. The programming for REFSEARCH was done by Allan Humphrey, Katsuhiko Kurano, and Rodney Randall.

The principal acknowledgments due here are to the School of Librarianship of the University of California and to the Office of Education of the Department of Health, Education, and Welfare, for making this work possible.

PART I - INTRODUCTION

WHAT REFSEARCH IS

REFSEARCH is a system for specifying a general reference requirement in terms that are compatible with the kinds of information and services usually offered by a general reference collection. The terminology employed is disciplined in such a way that it affords a procedural approach to this type of resource. While the procedure is not machine-dependent, it is straightforward enough to be machine-demonstrable, and the REFSEARCH "program" implemented in the Information Processing Laboratory is offered as a demonstration of the ways in which a reference collection might respond to an information requirement expressed in REFSEARCH terms.

WHAT REFSEARCH IS NOT

REFSEARCH is not a computerized reference service. The approach method which it embodies is not computer-dependent, and in any case does not extend to question negotiation on the one hand nor to data retrieval on the other. Nor does it represent any but the most elemental search strategy.

REFSEARCH is not a retrieval system in the ordinary sense. It retrieves sure sources of types of information which are likely sources of specific information. In this it reflects the kind of retrieval normally associated with reference service, except that in practice an experienced librarian also knows some sure sources of specific information.

REFSEARCH is not a substitute for thorough knowledge of reference tools: it seeks to provide a rationale to which unique aspects of these tools can be related in orderly fashion, as they become apparent to the student and to the new practitioner. It disavows unreasonable, uncorrelated efforts to memorize them before grasping their significance.

BACKGROUND

The REFSEARCH system is an outgrowth of research performed under a grant from the Office of Education for a project entitled "An Information Processing Laboratory for Education and Research in Library Science," OEG 1-7-071085-4286, one of whose aims was provision of a facility for mounting computer-assisted instruction (CAI) in librarianship subjects. In the course of investigating the suitability of General Reference work for presentation in this medium, it appeared that elements of the traditional instruction should first be re-cast, with more emphasis on the reference collection as a total resource rather than as a disparate assembly of books.

The REFSEARCH approach developed from this idea, and led to an intensive analysis of the practice collection of the School of Librarianship, and finally to the implementation of REFSEARCH as a free-standing module for use in General Reference instruction. The School of Librarianship gave substantial support to the foregoing during the developmental period, which covered approximately two years.

STATUS

The REFSEARCH system represents a new approach to the teaching of general reference skills. Its use as an element in current course work should not be construed as official acceptance of its concept or implementation except insofar as may be affirmed by your instructor. In developing the system to a degree of stability such that it could actually be demonstrated in the on-line terminal system of the Information Processing Laboratory it was necessary to make a number of commitments based on assumed rather than established principles.

This manual is intended as an explication of the REFSEARCH system as implemented in the Information Processing Laboratory, and as such must touch upon the reasons underlying the above commitments. However, the viewpoints expressed are those of the author and do not necessarily reflect those of the Office of Education nor of the School of Librarianship of the University of California.

PROCEDURAL

Users of this manual are urged to familiarize themselves with the rationale of the REFSEARCH system (Part II) before trying out the computer-assisted approach mechanism in the laboratory. Since search parameters are expressed in a fairly rigid "REFSEARCH language," it is important that the user know and use its terms as defined herein (Part III). Without an understanding of these parameters, some of the machine retrievals would be perplexing or misleading.

The next step should be to study the examples in Part VI to see how "handles" are identified and converted into channel entry terms, and how other elements of a search specification are assembled. Following this, the student will be ready to try some independent formulations of his own, in ways suggested at the beginning of Part VI.

II. RATIONALE AND DESCRIPTION

THE GENERAL REFERENCE COLLECTION

A general reference collection represents a type of information storage which is particularly resistant to formal methods of intellectual access, in that its parts are not organized uniformly and present no smooth interface for systematic retrieval of data. The fact that the data are multitudinous and for the most part very shallow is immaterial. The main impediment is the wild diversity of the works themselves: - in their format; their topical coverage; the kinds of services offered in respect to that coverage; the access routes furnished or denied; in their relative comprehensiveness, depth of treatment, scholarliness, authenticity; in their geographical, temporal, disciplinary, and philosophic bias; and in their purpose. For the most part they have been produced at different times, by competing publishers in an industry that places no great premium on consistency of pattern.

This in itself is not a bad thing, since it permits one who is completely familiar with the various works to devise access strategies using two or more works to retrieve information indirectly that could not be accessed directly in any one work. For such a person, the collection can be more than the sum of its parts. But for someone lacking this absolute familiarity, the collection can be much less - since he will not even be able to exploit all of the direct access routes.

THE COLLECTION AS A DATA BANK

If we were to take all of the works in a reference collection, strip them of their covers, title pages, indexes, and prefatory material, we would have a kind of data bank. How would we set about controlling it; that is, arranging it or providing it with an effective access mechanism - such as an index - which would respond to a data request with the location of that data (if it existed in the collection?).

An alphabetical topical index similar to those with which most reference works are already furnished would probably suggest itself as the most practical solution. A data request addressed to such an index really asks for, and the index responds with, location information. In such a huge index, what would we find at a given location? It might be just a name and a date, or it might be a long article on the topic of our query, or more likely yet a jumble of items every bit as heterogeneous in their way as the works in the original collection - chunks of information long and short, some fragmentary, derivative, repetitive, some containing data that really deserve to be accessed under some other topic, and so on. Theoretically, they could be reduced to a useful consistency by separating them into their smallest meaningful components and indexing them in that state. But this could make the index as large as the store of data! Or, again theoretically, they could be combined and rewritten. But for whom? For that purpose? According to what standard of usefulness?

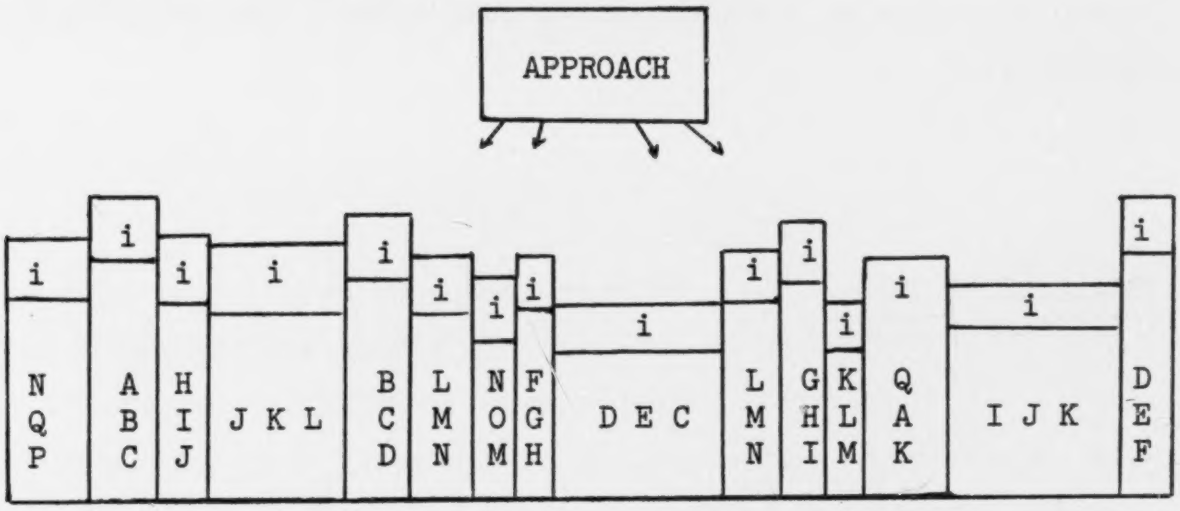
These are, in fact, issues which the designers of future data banks will have to face. Also, in a less heady context, they are issues that have plagued catalogers trying to decide how to make bibliographic description serve the real needs of patrons, how far to go with analytical entries, and so on.

Regardless of how accurately a topical index may locate data, it is at best a crude device if it sends the patron to items that can be of no possible use to him. Should we then consider some kind of superimposed "interpretive indexing" that would employ value/use criteria?

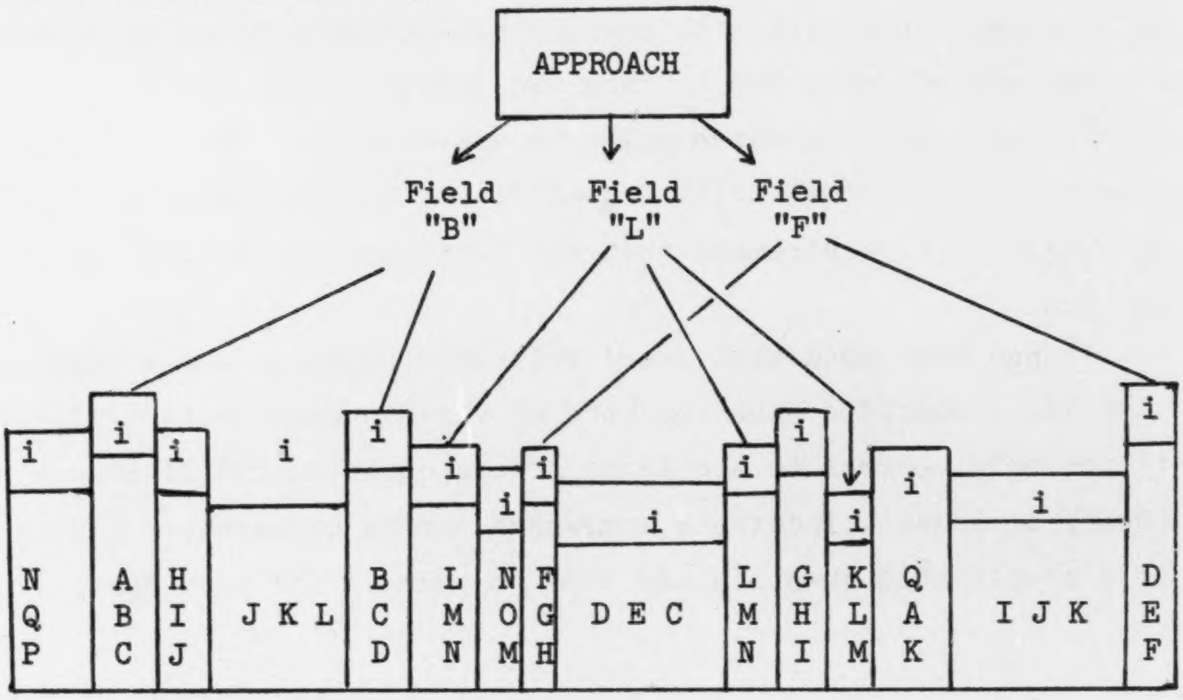
Before pursuing this question, let us turn back to the reference collection in its present form - a data bank, certainly, but one which we can't very well at the moment tear apart and put together again along more scientific (and less ruggedly individualistic) lines.

CLASSIFICATORY SUPERSTRUCTURE

Most reference works have an alphabetical topical index, or their contents are arranged alphabetically so as to provide their own such index. For the moment, let us assume that they all do. Let us further assume that each work deals with three fields, of which one or two are dealt with in other works in the same collection. This allows us to visualize the following profile:


APPROACH
i
N Q P
A B C
H I J
J K L
B C D
L M N
N O M
F G H
D E C
L M N
G H I
K L M
Q A K
I J K
D E F

Looking at it from the top, all we see are the indexes (i), all in separate alphabets. It would be nice if they could be merged at the "approach" level, but that isn't feasible, so the next best thing is to try to remember which fields underlie each separate index so that we can use them selectively:


APPROACH
Field "B"
Field "L"
Field "F"
i
N Q P
A B C
H I J
J K L
B C D
L M N
N O M
F G H
D E C
L M N
G H I
K L M
Q A K
I J K
D E F

This implies the kind of partitioning that can initiate classified indexing, and since it is superimposed on sets of alphabetical arrangements it amounts to a classificatory-alphabetical approach to the data.

REFSEARCH uses this approach, but it is enabled to limit classificatory detail to an absolute minimum by virtue of the fact that most reference works identify themselves at the major partition (field) level, or not far below it. To pursue classificatory subdivision beyond the point of contact with a work's own index would hardly be worthwhile.

ESTABLISHING THE TOPICAL PARTITIONS

A good reference collection touches (however lightly) on almost everything in human experience. REFSEARCH attempts to partition this experience, or interest, in a reasonably way, through the use of field designators (also called channel entry terms) each of which relates to a definable category of information.

Such an exercise embroils one in age-old dilemmas, but the attempt in this case was not as brash as it seems, because it sought only to stylize an arrangement that would be hospitable to typical reference questions; it did not seek philosophic sanction. The terms did not even need to be mutually exclusive as long as each covered a readily-definable data concept susceptible to further partitioning along systematic lines.

The set of terms had to face two ways: toward the collection, and toward the questions which might be asked of it. The latter aspect imposed an additional criterion affecting the selection of fields or channels, a requirement that the terms by apt and readily come to mind.

It has been said that every reference question has a "handle," that is, a specific noun (or word or phrase used nominatively) that is not only central to the sense of the question but is also - in theory at least - indexable somewhere in the collection. The verbiage of a complicated question may tend to conceal the true handle. There may in fact be more than one of them, in which case the searcher tries to select the one to which the indexes in his collection are most likely to respond. Moreover it appears that the searcher, in order to do this, must be able to translate the "handle" into some categorical term that fits his notion of the kinds of things indexes are about. The expert does this automatically; the learner needs to deliberate upon it.

Accordingly, only terms into which "handles" can be translated readily and naturally, without mental gymnastics, are suitable as categorical terms controlling the approaches to the data.

After extensive probing of the Library School's practice collection, we chose the following categories (or "fields" or "channels") as the most appropriate for general reference purposes, being neither too broad to exercise a control function, nor too narrow and numerous to suggest themselves as handles:

ART WORKS
CONCEPTS
CORPORATE BODIES
DATES
ERAS
EVENTS
FIELDS
HUMAN PROCEDURES
LANGUAGES
LAWS
LIVING OBJECTS
NATURAL PROCESSES
NON-LIVING OBJECTS
PERSONS
PLACES
PRODUCTS
WORDS

Some of these were defined for their intended use quite simply (e.g., PERSONS = "human beings, or beings modeled primarily on the human"), while others that tended to encroach on their neighbors had to be carefully distinguished (e.g., HUMAN PROCEDURES calls for a small essay.) Neither the terms nor their definitions presume to be ultimate; the list reflects choices with which not everyone will agree, but it serves well enough as a basis for further development.

ESTABLISHING INTERMEDIATE QUALIFIERS

The next step in developing access channels was to subdivide or qualify the channel entry terms in such a way that they became roughly sub-classed, and could be readily narrowed to correspond more closely with the type of thing(s) referred to in a query and in a particular index. We had to make explicit the various qualifying options that are usually understood but not always expressed (e.g., proper name? common name?), qualities that have a high discriminatory power in relation to different compilations of data.

For example we would categorize Victor Hugo (handle) first as a PERSON (channel entry term), then as DEAD (qualifier), as REAL (qualifier), as PROPER-NAMED (qualifier), and as an INDIVIDUAL (qualifier), thereby attaining the kind of topical specification accommodated very well by some reference works and not by others. Additional qualifiers in this channel are COMMON-NAMED, LIVING, IMAGINARY, CAPITALIZED ROLE, and CAPITALIZED GROUP.

CORPORATE BODIES (channel entry term), to take another example, are qualified as to whether they are PROPER-NAMED or COMMON-NAMED, REAL or IMAGINARY, PROFIT or NON-PROFIT, and/or of INTERNATIONAL character.

Each of these terms is defined in the particular context in which its use is envisaged. Since most of them pertain to several categories, the total set of terms is fairly small (21) and easily remembered, even though they require a large number of contextual definitions (Part III).

It will be observed that the omission of any term or terms from a chain of qualifiers does not invalidate the search channel; it simply makes it less discriminating. If we didn't know that Victor Hugo was REAL, we could specify PROPER-NAMED INDIVIDUAL PERSON and still be able to locate him in some "person" index, even though we might be sidetracked momentarily in *Brewer's Dictionary of Phrase and Fable*. By the same token, lengthening the chain of qualifiers makes the specification more precise.

ESTABLISHING SPECIAL QUALIFIERS

Frequently an opportunity arises wherein qualifiers in addition to the general or "intermediate" set would be useful. To exploit this, two sets of special qualifiers have been established:

activities (GOVERNMENT, TOURISM, HISTORY, MATHEMATICS, MUSIC, etc.) called subcollections, and a list of 20 time spans (MIDDLE AGES, 19TH CENTURY, 1961-1965, 1966, etc.). Unfortunately these additional qualifiers, as presently coded and programmed, can overtax the system as an approach mechanism unless they are used with discretion. Under some circumstances they tend to bring the specification too close to the data. This will become more apparent after we examine some of the other options available at the data level.

ESTABLISHING SERVICES

Having gone as far as we can with topical specification, we can turn to the kind of indexing referred to earlier as "interpretive," i.e., oriented toward criteria of usefulness. If all works organized their data alike and offered the same kind of information about the things in their purview as their neighbors offered for their things, we might survive with a solely topical approach. However, as we know, reference works do differ markedly from each other as to the kind of information they may supply about identical or similar topics, and within their own covers vary their treatment of dissimilar ones. This circumstance accounts for the major part of the burden imposed on the learner's memory, under traditional instruction.

On the other hand, this same circumstance can be turned to advantage in the approach methodology sought in REFSEARCH, because it permits us to particularize a search much more closely at the intermediate level.

Almost every reference question implies the need for some kind of service; it asks for a kind of information about a kind of thing. There is a rough correspondence between types of service-needs implied in reference questions and types of services proffered by reference works. Generally speaking, they involve a form of identification or of discussion or of narration, or a combination of these. Many of the works exhibit somewhat narrower functions, however, and since it would be a pity not to take advantage of this fact, these three were expanded to a set of nine, as follows:

If a work---	It---
DEFINES	gives the characteristics that distinguish named thing(s) from others.
IDENTIFIES	gives, in non-discursive style, properties that serve to distinguish named thing(s) from others. Identification may be accomplished through graphics.
DISCUSSES	supplies facts and/or opinions in discursive style.
LOCATES	gives street address of, or latitude and longitude of, or shows on a map, or names adjacent locatable entities. With LAWS, it gives the area of applicability.
DATES	gives key dates in the history of the named thing(s).
QUANTIFIES	gives numerical data (excluding financial) that serve to characterize named thing(s). The work must regularly and predictably present such data in order to fit here. If they are scattered incidentally in prose, the work DISCUSSES.
CHRONICLES	gives newsworthy developments connected with the indexable name of the thing(s) in an action-by-action style that generally fits the order of time. Matter that DISCUSSES is not as time-bound as matter that CHRONICLES, nor is it confined to recording actions. Matter that CHRONICLES digests or summarizes the "news" of history.
JUDGES	assesses the artistic merit of ART WORKS, or the achievements of PERSONS, from a critical point of view.
$ (convention)	gives financial data that serve to characterize named thing(s). A work must regularly and predictably present such data in order to fit here. If they are merely scattered in prose, the work DISCUSSES.

These characteristics give an added dimension to every question and to every work in the collection. They can be thought of as lying in a plane at right angles to the plane of the topical descriptors. They naturally into verb forms, whereas channel entry terms are always nominative, qualifiers adjectival:

"I require a work that	discusses	real,	living,	proper-named	persons."
	(service)	(qual)	(qual)	(qual)	(channel)
	(verb)	(adjectives------------)			(noun)

affording a kind of syntactical coherence that proves useful in a number of ways.

THE INTERMEDIATE MATRIX

To illustrate the kind of matrix formed by qualifiers intersected by services, the relatively simple channel of PLACES is used in Plate 1 (next page). The range of 63 possible combinations indicated in the diagram becomes 268 when two services are specified, peaks at four services, and collapses to nine at all/none.

In the case of the PERSONS channel (not diagrammed) there are nine different intermediate qualifiers, and 896 single-service combinations are possible.

The general definitions of services given on page 14 are too gross for application in all contexts, so within each channel they are interpreted or redefined, in the same way as the intermediate qualifiers (Part III).

ESTABLISHING SPECIAL SERVICES AND MISCELLANEOUS CONTROLS

Reference works exhibit a variety of additional services and service-connected characteristics which are indispensable in satisfying some questions and are immaterial for others. While their presence is not conclusive, their absence often is. This permits the searcher to rule out, immediately, numbers of otherwise promising sources. These "special services and miscellaneous controls" are identified as follows:

PLACES		DEFINES	IDENTIFIES	DISCUSSES	LOCATES	QUANTIFIES	DATES	CHRONICLES	\$	ALL/NO CHOICE
PROPER NAME -	REAL		X	X	X	X	$\boxed{X}$	X	X	X
	IMAGINARY		X	X	←	←	←	←	←	X
	BOTH/EITHER		X	X	X	X	X	X	X	X
COMMON NAME -	REAL	X	X	X	X	X	X	X	X	X
	IMAGINARY	X	X	X	←	←	←	←	←	X
	BOTH/EITHER	X	X	X	X	X	X	X	X	X
BOTH/EITHER -	REAL	X	X	X	X	X	X	X	X	X
	IMAGINARY	X	X	X	←	←	←	←	←	X
	BOTH/EITHER	X	X	X	X	X	X	X	X	X

Key:

X = intermediate-level specifications (total: 63)

← = subsumed under other services

i = proper names are held to be indefinable throughout the system

$\boxed{X}$ = specification implied in "When was Singapore founded?", i.e., "I want a work that $\underset{\text{(service)}}{\underline{\text{dates}}}$ $\underset{\text{(qual)}}{\underline{\text{real}}}$ $\underset{\text{(qual)}}{\underline{\text{proper-named}}}$ $\underset{\text{(channel)}}{\underline{\text{places}}}$."

Plate 1

Work contains---

graphics
profuse graphics
colored graphics
atlas
maps
charts and/or diagrams
general tables
architectural drawings
portraits
pictures of
pictures by
picture index

Work contains---

general bibliography
bibliography of writing about
bibliography of writings by
serials by (corporate bodies)
sources
documents
items of state
news reportage
fictitious names
mythological names
comparative/superlative ratings

Work was published in or since---

1950
1960
1966
1967
1968
1969

Work frames data for---

USA
CANADA
UK/Commonwealth
Other nations
Continents
World

Inclusion of these special controls in a specification dramatically reduces (often to zero) the number of works otherwise retrievable according to data elements and intermediate services. The searcher needs to know whether the element is mandatory or merely desirable, so that he can in the latter case fall back on the larger set. Unless his perception of each work according to these terms is complete and adequate, he is well advised - in any case - to use special services and miscellaneous controls only provisionally.

The remarks made earlier in connection with the two sets of special qualifiers ("subcollections" and "time-spans") apply here. By lengthening the chain of required elements beyond the intermediate range, we achieve great precision but may overtax the system as an approach mechanism.

THE "WORDS" CHANNEL

Before standing back to look at REFSEARCH as a whole, we must briefly consider WORDS, a category that doesn't take well to any of the intermediate qualifiers and services that apply to the other channels, except for the "*defines*" service.

WORDS is indeed a special case, concerning itself not with non-word things represented by words, as with other channels, but with words represented by words, i.e., by themselves. Words follow patterns all their own, reflected in the following breakdown:

Qualifiers	Services
SYNONYM/ANTONYM	DEFINES
SLANG	PRONOUNCES
ABBREVIATIONS	ETYMOLOGY
FOREIGN TERMS	USAGE
SIGNS/SYMBOLS	CONTEXT
NICKNAMES	SPELLING
SCIENTIFIC NAMES	PUNCTUATION

THE REFSEARCH TERMINOLOGY AS A LANGUAGE

In the foregoing sections we have considered five sets of terms with which one may build a search specification:

17	channel entry terms
21	qualifiers (intermediate) (7 for WORDS only)
60	qualifiers (subcollections and time-spans)
15	services (intermediate) (6 for WORDS only)
39	services (special services and miscellaneous controls)
152	total terms (out of context)

Since many of the intermediate terms have special meanings depending on the channel contexts in which they are used, the terminology is considerably larger and more subtle than the above numbers indicate.

Type of term	Out of context	In context
channel entry terms	17	(17)
intermediate qualifiers	21	54
intermediate services	15	89
other qualifiers and services	99	(99)
Totals	152	259

Using this vocabulary, it would be possible to construct over a million different specifications, but of course many of them would be nonsensical. In practice one never uses more than one channel entry term, never uses intermediate qualifiers and services borrowed from other channels, and never uses antithetical pairs of qualifiers (e.g., REAL/IMAGINARY, LIVING/DEAD, PROFIT/NON-PROFIT, COMMON NAME/ PROPER NAME, INDIVIDUAL/GROUP).

The omission of a term does not invalidate the specification, and in the case of antithetical qualifiers has the effect of specifying "either/both" simply by default.

The fact that the terms gravitate naturally into forms of nouns (channels), adjectives (qualifiers), and verbs (services) encourages one to think of the REFSEARCH vocabulary as constituting a kind of language which needs to borrow only a few connectives to be able to form sentences in plain English. For example a specification such as

> PLACES PROPER-NAMED CHRONICLES TWENTIETH CENTURY CANADA
> 1968 (recency)

becomes (to one who knows his way around in the language)

> "Required: a work which CHRONICLES the history of PROPER-NAMED PLACES IN CANADA. It must cover the TWENTIETH CENTURY and must have been published since 1967 ('no less recent than 1968')."

A second sentence isn't always needed, even when special qualifiers and/or services are called for. For example,

> PERSONS CAPITALIZED ROLE 16TH CENTURY MULTI-NATIONAL PORTRAITS
> RELIGION DISCUSSES

derived from, say, a question like

> "I want to read up on the 16th Century Popes, with portraits if possible".

becomes

> "Required: a work that DISCUSSES 16TH CENTURY MULTI-NATIONAL RELIGIOUS PERSONS in their CAPITALIZED ROLES, with PORTRAITS."

(Note that by specifying PORTRAITS the above may not be satisfied anywhere in the collection. It is the first term that should be abandoned or deferred in case of zero retrieval on the first specification.)

TOWARD A METHODOLOGY When the librarian moves into a position from which he can view the collection objectively, he places himself in closer partnership with the patron - the better to negotiate and formalize the latter's information requirement. In a typical situation he can ask

(1) What kind of things are we dealing with?
(2) What kind of service is needed?
(3) Which works are most likely to fulfill both requirements?

It is believed that accomplished reference librarians do in fact carry out some such mental process, reflexively, in performing what seem to be feats of memory and intuition. (1) and (2) above are easily transposed, and it is reasonable to suppose that the expert makes an instantaneous choice as to which will rule out more quickly the greater number of unsuitable candidates.

REFSEARCH does not seek to improve on the methods used by experienced reference librarians, only to identify, understand, and demonstrate them. It is a matter of making explicit, in slow motion, the mental processes which we *believe* such a person carries out without even stopping to reflect that he is following a procedure. Probably he doesn't carry on a conversation with himself - "Let's see. Nero, eh? Try something indexed for persons. Has to discuss him. Dead. DNB? No. Not English. Real? Yes. Fellow mixed up in Roman history. Langer? Discusses. Name access. Try it." -- but we do feel there must be some inchoate progression of the sort, involving *awareness of the topical and service characteristics* of every work under his cognizance.

The obvious purpose in trying to formalize part of this hypothesized methodology is to encourage students to view the collection in somewhat the same way as the veteran has learned to do by experience, to recognize that it is something that can serve one quite well even during the process of learning about it. Conscious attention to service characteristics may be the key to this.

THE LABORATORY MODEL OF REFSEARCH APPROACH

In the three-step question above, as well as in the arrays of service functions and data elements, the outline of a computer program will be perceived by those who have had some acquaintance with this aspect of librarianship. I have avoided invoking the computer up to this point because the "system" as such is not computer-dependent, and the program in which REFSEARCH is demonstrated in the Laboratory accomplishes only one step in the process. It does little more than provide a memory service, on which even a novice librarian probably would not want to depend very long.

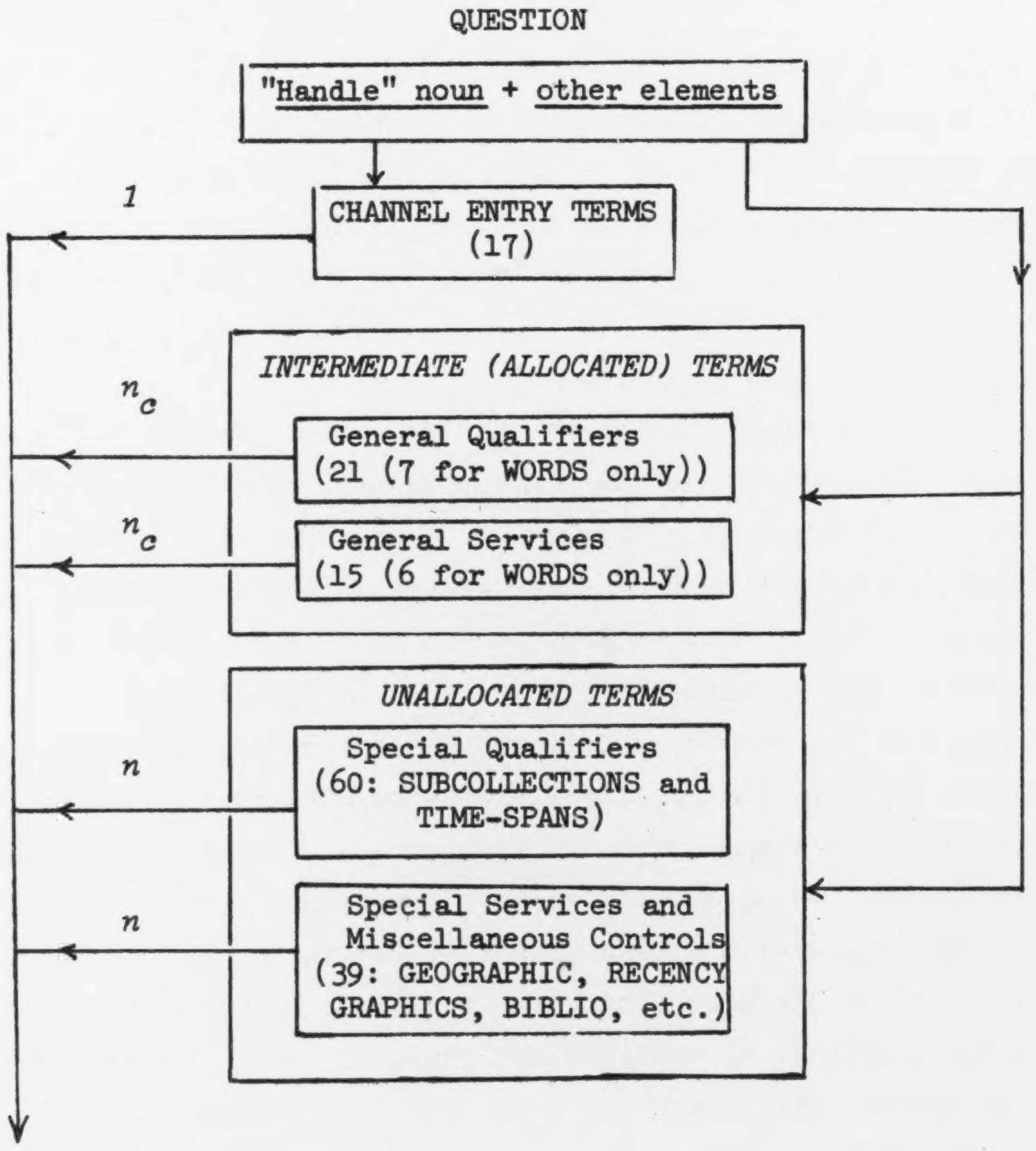
Plate 2 is a kind of flow-chart, ending rather abruptly with a specification oriented toward the sources of reference data rather than to the data themselves. In order to respond to such a specification, the information system (human or other) needs to contain an exact and detailed file of source attributes. Such a file we set about building, as the basis for the machine-assisted version of REFSEARCH.

The practice collection used in the General Reference Course taught in the School of Librarianship typifies the selection of titles one might find in the reference rooms of many general libraries throughout the United States. Among its 160 works (790 volumes) are found most of the general "classics," plus a number of special subject works and a smattering of peripherals. Using the terms and criteria described in the preceding sections, we analyzed and coded all of them except for some of the general encyclopedias, some "thin" materials, and a few oddities that promised more trouble than they were worth. The total amounted to 144 works.

The characteristics of each work were listed on coding sheets and later transferred to six-card decklets of punchcards. Coding was very tentative in the early stages, because there was no way of knowing in advance how well the terminology would fit the facts, or, to put a finer edge on it, how well our notions of the typology of reference would bear up. Some terms were redefined, some were dropped, and a few new ones were established (including two of the channel entry terms - LAWS and LANGUAGES - covering topics that didn't fit well under either HUMAN PROCEDURES or CORPORATE BODIES).

(Plate 2)

SPECIFICATION PROCESS


QUESTION
"Handle" noun + other elements
1
CHANNEL ENTRY TERMS (17)
INTERMEDIATE (ALLOCATED) TERMS
n_c
General Qualifiers (21 (7 for WORDS only))
n_c
General Services (15 (6 for WORDS only))
UNALLOCATED TERMS
n
Special Qualifiers (60: SUBCOLLECTIONS and TIME-SPANS)
n
Special Services and Miscellaneous Controls (39: GEOGRAPHIC, RECENCY GRAPHICS, BIBLIO, etc.)

SPECIFICATION

Required: *a work that (n services) (n qualifiers) (1 channel entry term).*

(Optional add:)

Required (desired) also that: *(n services)(n qualifiers)* delimit search.

(Note: n_c = number in channel context)

Example.

Question: "I've heard that Kurt Gödel, the mathematician, lives somewhere in the United States. Where can I find his home address?"

(cont.)

(Plate 2, concl.)

Handle: Kurt Gödel, a PERSON.

Channel entry point:	PERSONS
Service required	LOCATES
Qualifier:	PROPER NAME
Qualifier:	REAL
Qualifier:	INDIVIDUAL
Qualifier:	LIVING
Unallocated service:	USA
Unallocated qualifier:	MATHEMATICS

Specification:

Required: *a work which locates real, proper-named, individual, living persons. Must cover mathematic(ian)s in the United States.*

Encyclopedic works gave a great deal of difficulty, because even those with a scientific, religious, or philosophic bias strive for a kind of universality. This has the effect of inducing positive coding all along the line, which becomes meaningless. If we were to introduce "scope" or "depth" criteria to counteract this effect, one might well ask why not also introduce "authority" or "scholarliness." In other words we would become ensnared in qualitative judgments at the data level.

Encyclopedias raised havoc with the family of qualifiers we have dubbed "subcollections," designed to highlight coverage of various disciplines and activities. These works ofttimes cover several disciplines very well indeed. Does this mean they should be positively coded for all? The question was resolved arbitrarily and not very satisfactorily by casting out all disciplinary qualifiers from works that embrace more than eight.

Since the quality of the coding inevitably determines the effectiveness of the system, this task had to be carried out quite painstakingly. Over ten thousand coding decisions were involved, and the process took ten and a half man-months. Some decisions were taken with reluctance, because terms didn't always exactly fit, and these borderline cases will probably evidence themselves from time to time when a retrieval is made that the user disagrees with, or a work is not retrieved that the user believes does fit the specification. Gradually, it is hoped that these discrepancies will be resolved, or at least be well enough understood so that they do not impair the instructional utility of the program.

THE PROGRAM

The computer program retrieves all documents whose profiles enclose the profile of a specification. Only works that are positively coded for all the elements of a search specification are retrieved. The program imposes no hierarchy or sequence requirement: terms may be entered in any order.

All elements are treated at the same level, so it is possible to query the system on any term or combination of terms without regard to the term's position in concept space. Retrievals are made on-line. The program and file are maintained on disc and operate under the Laboratory's Terminal Monitor System.

USE OF THE MACHINE ASSISTED APPROACH PROGRAM

A person wishing to use REFSEARCH types in the code numbers corresponding with the terms set forth in the Classified Index of Terms (channels/qualifiers/services) in Part IV. When the specification is complete, he signals the fact to the computer by pressing the "send block" key at his console.

Retrieval takes 6 or 7 seconds, regardless of the number of terms in the input string. Output is in the form of a display indicating the total number of works retrieved, and listing their titles.

If the user suspects that he may have missed some likely sources because he specified his requirement too narrowly, or if on the other hand he retrieves a plethora of works because his specification was too broad, he can go back and edit his original request, and try again.

To illustrate the foregoing, let us continue with the example in Plate 2, which reached the point of specifying the type of reference work which would be a likely source of Kurt Gödel's address.

The specification is now annotated with the numerical code corresponding with each element:

Required: a work which $\underset{345}{\underline{\text{locates}}}$ $\underset{339}{\underline{\text{real}}}$ $\underset{334}{\underline{\text{proper-named}}}$ $\underset{335}{\underline{\text{individual}}}$ $\underset{341}{\underline{\text{living}}}$

$\underset{(333)}{\underline{\text{persons}}}$. Must cover $\underset{528}{\underline{\text{mathematic(ian)s}}}$ in the $\underset{558}{\underline{\text{United States}}}$.

The code representing the channel entry term PERSONS is entered parenthetically above because all the other codes except those for MATHEMATICS and U.S.A. are taken from the PERSONS channel. They already imply PERSONS, so it is unnecessary to input that particular code - though it does no harm to do so. (One would need to use it only if no context-assigned, or allocated, terms were specified, as in Example #18, page 123.)

Before calling up the machine-assisted approach program at one of the on-line terminals, certain preliminaries are advisable:

1. Questions should be written down in *negotiated* form, i.e., the best expression of what the patron really wants to know.

2. The most likely "handle" to each question should be identified (underlining suggested), and second choices considered for use in case first choices don't work out.

3. Next, the appropriate channel entry terms are selected. They are best jotted immediately under the handles.

4. Turning to the Classified Index in Part IV, the student should check, for each question, the block of intermediate qualifiers and services applicable to the chosen channel entry term, and begin constructing his specification(s). If in doubt about the sense in which a particular term was used by the coders (who thus controlled its "REFSEARCH meaning") the definitions in Part III should prove helpful. The also indicate briefly why some qualifiers commonly used are excluded from use in certain contexts, e.g., IMAGINARY ART WORKS.

5. Now the student should consider what special qualifiers and services (those not assigned in channel contexts) would be reasonable to specify, bearing in mind that he may have to abandon one or more of them if the collection - as coded - does not respond to so narrow a specification. TIME-SPANS and RECENCY are especially touchy in this respect.

6. We have found it useful to write down specifications in the form shown in the examples given in Part VI, with the code numbers noted under each active term. After becoming familiar with the structure of the Classified Index, the user will be able to take advantage of the speed and convenience of the Coding Key which follows it (page 93).

7. If the student plans to test the system with several mutations of the original specification, a rough grid is recommended for recording

results. The document numbers are useful in this connection, since they are entered more easily in a grid arrangement than are the titles of the works. In case of confusion, one can always check their identity by consulting the numerical list given in Part IV, or by calling up a display of the list from the terminal, as described in Part V.

PART III - DEFINITIONS

The REFSEARCH system uses a "language" of 144 words and phrases to express the parameters of search specifications and to characterize individual reference works:

Channel entry terms		17
Qualifiers	("WORDS" channel)	7
"	(other channels)	15
Services	("WORDS" channel only)	6
"	(other channels)	9
Special services and miscellaneous controls		90

Most of the qualifiers and service terms do multiple duty: their significance varies according to the context of the channel in which they are applied. For example, QUANTIFIES (a qualifier) has a different significance when used in connection with PLACES (a channel entry term) than it does when used with PERSONS (another channel entry term), even though the elemental meaning is the same. These terms are specially defined, under individual channel entry terms, when necessary, in order to give them the necessary semantic precision for use in a particular context.

Channel entry terms are defined in considerable detail in order to stipulate the ramifications of each category, while at the same time limiting the category in ways designed to prevent it from overlapping other categories.

Channel entry terms

These terms identify broad subject categories used to enter the system:

Term	Page
ART WORKS	33
CONCEPTS	35
CORPORATE BODIES	37
DATES	40
ERAS	40
EVENTS	42
FIELDS	45
HUMAN PROCEDURES	46
LANGUAGES	49
LAWS	51
LIVING OBJECTS	53
NATURAL PROCESSES	58
NON-LIVING OBJECTS	60
PERSONS	63
PLACES	68
PRODUCTS	71
WORDS	74

Qualifiers

Terms used to qualify channel entry terms in order to narrow the data specification. In general, they can be regarded as inclusive rather than exclusive, e.g., while a specification of REAL will retrieve works that include REAL (specified categories), it will not reject those that include IMAGINARY in addition to REAL.

Services

Terms used to specify the type of service required. In order to qualify for positive coding under one of these terms, a work must be arranged and/or indexed in such a way that the required data can be assessed under its own name or category, either directly or through an index which is integral to the work.

Subcollections and Miscellaneous Controls

Terms used to narrow a specification in ways not provided through channel entry terms, qualifiers, and services. Except for disciplines listed under "subcollections," these terms tend to exclude works that qualify only in a very general way.

	page
Sub-collections	76
Miscellaneous Controls	78
Geographic	78
Recency	79
Special Services	80
Time Span	83

GENERAL DEFINITIONS

Qualifiers

PROPER NAMES = names, usually capitalized, of unique entities.

COMMON NAMES = names of classes sometimes capitalized but usually in lower-case.

REAL = the quality of being present in the world between points on a time scale and also of being representable within at least one medium for storing and/or transmitting human communications.
Media are themselves real: print, clay, wood, metals, film, TV, actors, magnetic tape, phonodisks, and so on.

IMAGINARY = the quality of being unable to present itself in the world, but only representable in some medium. One's experience with an imaginary thing is solely through media; assertions about it concern only the representation. Thus Real = presentable + representable; Imaginary = representable only.

(Special cases: ART WORKS (see page 33)
CONCEPTS (see page 35)

LIVING = used as a further qualification in connection with PERSONS, because biographical works often exclude this class. The term applies as if the reader were using the work as of the date of its compilation. To correct for time lapse since that date, one can specify RECENCY (page 79).

DEAD = the same.

INDIVIDUAL =)
PART =)
GROUP =)
CAPITALIZED ROLE)
CAPITALIZED GROUP)
PROFIT)
NON-PROFIT)
INTERNATIONAL ONLY)

See Definitions under PERSONS, NON-LIVING OBJECTS, CORPORATIONS

Under proper names

IDENTIFIES = gives, in non-discursive style, properties that serve to distinguish named object from others. Pictures may identify.

DISCUSSES = adds facts and/or opinions in discursive style. Encyclopedias fit here.

LOCATES = (1) gives street address of, (2) gives latitude and longitude of, (3) shows on a map, (4) identifies adjacent locatable entities, (5) or gives (with LAWS) area of applicability.

DATES = gives key dates in the history of.

QUANTIFIES = gives numerical data (excluding financial) that serve to characterize named object. Work must regularly and predicably present such data in order to fit here; if such data are merely scattered incidentally in prose, the work DISCUSSES.

CHRONICLES = gives newsworthy developments connected with the indexable name of the object, in an action-by-action style that generally follows the order of time. Matter that DISCUSSES is not as time-bound as matter that CHRONICLES nor is it confined to recording actions. Matter that CHRONICLES will digest or summarize the "news" of history.

JUDGES = assesses the artistic merit of ART WORKS, or the achievements of PERSONS, from a critical point of view.

$ = gives financial data that serve to characterize named object. Work must regularly and predictably present such data in order to fit here; if financial data are merely scattered in prose, the work DISCUSSES.

Services under common names

DEFINES = gives properties needed for membership in the class named.

IDENTIFIES = names, by proper name, members of the class designated by the common name.

LOCATES =)
DATES =)
QUANTIFIES =) - same as for PROPER NAMES, but
CHRONICLES =) for "object" read "class."
$ =)

(See CORPORATE BODIES for four additional services special to that category.)

The foregoing general definitions vary somewhat in their interpretation, depending on what kinds of thing are being considered. In the pages which follow, the applicable definitions are reported and interpreted. Omission of a term under a particular category indicates that the term is not considered applicable.

ART WORKS

Channel entry term	ART WORKS = the products of the fine arts (which include painting, drawing, architecture, sculpture, poetry, music, dancing, and dramatic art.) "Poetry" should be construed to mean belletristic literature in general, including novels. Films are also included here.
Qualifier	PROPER NAME = Titles of unique, particular creations; e.g., Aida, 8 1/2, Vanity Fair, Les Sylphides, Kubla Khan, the Bible, the Blue Boy, the Thinker, Le Petit Trianon, Hamlet, the Emperor Concerto.
Services under proper-named art works	IDENTIFIES = gives properties that serve to show origin and nature of work and to distinguish it from others. Genre and creator's name are key identifiers.
	DISCUSSES = adds facts and/or opinions in discursive style.
	LOCATES = gives names of museum in which housed; addresses of famous buildings.
	DATES = gives key dates in the history of, as of creation, publication, production, exhibition, etc.
	QUANTIFIES = gives dimensions of physical works; word-count or divisions of literary works; duration of musical works; etc.
	CHRONICLES = gives action-by-action account of newsworthy developments connected with art work (i.e., listed under its indexed name.)
	JUDGES = gives opinion on the artistry of the work - its strengths and weaknesses. Such opinions may stand alone, or may be interwoven with matter that discusses. If the latter, the work both DISCUSSES and JUDGES.
	$ = gives financial data on the work, such as the earnings of a play or novel, the prices commanded by paintings and sculptures, costs of famous buildings, etc.

Qualifier

COMMON NAME = all generic titles of art works, e.g., ode, play, ballet, symphony, gouache painting, novel, limerick, movie, tapestry, haiku, etc.

Services under common-named art works

DEFINES = gives properties needed for membership in the group designated by the common name.

IDENTIFIES = names (by proper name) members of group designated by the common name.

DISCUSSES = adds facts and/or opinions, in discursive style.

LOCATES = gives address(es) of place(s) where type(s) of art are found.

DATES = gives key dates in the history of a genre; e.g., invention of a form, its rise, decadence, disappearance, etc.

QUANTIFIES = gives statistics on a particular type of art work; e.g., number of novels sold in the U.S. last year; number of feature-length movies made in Japan in 1960.

CHRONICLES = gives action-by-action account of newsworthy developments connected with type of art work (i.e., listed under its indexed name.)

$ = gives financial data on type of art work; e.g., average cost of operas produced in New York; annual dollar sales of novels in the U.S., etc.

Qualifiers NOT used

REAL. Virtually all works named in the collection are real, even if they are not genuine.

IMAGINARY. The collection does not extend to such "works" as certain writers invent and assign to the fictional artists or writers in their stories, e.g., Thomas Mann, Somerset Maugham.

CONCEPTS

Channel entry term

CONCEPTS = abstractions not assignable elsewhere in this scheme, including broad ones such as "Marxism" or "Christianity" encompassing whole bodies of doctrine.

When we look at the *concept* of something, that something ceases to be our referent. Instead, we are examining the (seldom explicit) rules that govern how the expression naming the something is used to denote and to connote. The range of denotation and connotation for many expressions changes through time; to investigate and to record such changes is an important task of the historian of ideas.

We must distinguish between CONCEPTS and a number of other entry points in this scheme. WORDS comprises all parts of speech nominalized to name themselves. Of the *nouns* of this set, only some (when not naming themselves) name abstractions. Those that do *not* name abstractions do not fit under CONCEPTS. Moreover, those that name abstractions that this scheme can include under FIELDS, NATURAL PROCESSES, HUMAN PROCEDURES, LAWS, EVENTS, ART WORKS, or any other category should not be put here. To illustrate, as work that DISCUSSES "representative or typical characteristics of a class may deal with it as a concept. Thus we might have concepts of revolution, or the novel, or public relations, discussed in articles concerning these, which belong represeitvely to EVENTS, ART WORKS, and FIELDS. They should be approached through those entry points rather than through CONCEPTS.

We are left with a subset of nouns that name abstractions and that resist placement in other categories. It is this subset that occupies the hazy area where WORDS and CONCEPTS overlap. A work that gives definitions of WORDS will help fix them as CONCEPTS, particularly if it also gives ETYMOLOGY, USAGE, and SYNONYMS. The only real difference between DEFINITIONS of WORDS and "DEFINES CONCEPTS," given below, is that CONCEPTS is meant to be invariably linked with the name of one or more *subcollections* from this scheme, whereas WORDS is not necessarily so linked. The various general dictionaries, for example, will not usually be placed in any subcollection.

Furthermore, even unabridged dictionaries omit innumerable compounds - noun phrases - that name concepts. Thus we could look up "objective" and "correlative" in a dictionary without learning what is meant by T.S. Eliot's "objective correlative." A work that DEFINES CONCEPTS in the LITERATURE sub-collection, however, would probably contain Eliot's term. So, too, we might seek CONCEPTS in EDUCATION for a definition of "academic freedom"; CONCEPTS in MATHEMATICS for "Markov chains": or CONCEPTS in RELIGION for "baptism for the dead."

DEFINES = gives minimal conditions under which term may be successfully used.

DISCUSSES = adds facts and/or opinions in discursive style. (The conditions mentioned above may be expanded upon to denote a term's connotive range.)

DATES = gives dates of the emergence, revision, decline, etc., of a particular concept (excluding those under NATURAL PROCESSES and HUMAN PROCEDURES.)

QUANTIFIES = gives formulae or numerical data that serve to characterize concept.

CHRONICLES = gives action-by-action account of newsworthy developments indexed under the name of a particular concept (e.g., under "Academic freedom.")

Services not used under concepts

(locates) = (Certain concepts are associated with places, e.g., "Caesaripapism" with Byzantium, but they cannot be said to be "located" there.)

Qualifiers not used

(proper name)) The distinction is not pertinent in most
(common name)) reference data.
(real) See 1st page of General Definitions.
(imaginary)

CORPORATE BODIES

Channel entry term	CORPORATE BODIES = An organization or group of persons that is identified by a name and that acts or may act as an entity. Examples: associations, institutions, business firms, non-profit enterprises, agencies of governments, conferences. Persons in corporate bodies usually share certain broad aims and have some kind of physical plant, headquarters, or other address for their joint activities.
Special keys	PROFIT = special key enabling searcher to request work(s) dealing with particular corporations intended to make money for their owners.
	NON-PROFIT = special key enabling searcher to request work(s) dealing with particular non-profit-making corporate bodies.
	INTERNATIONAL ONLY = special key enabling searcher to request work(s) dealing solely with particular international bodies (and hence usually the most detailed in their treatment of such organizations.)
Qualifier	PROPER NAME = Capitalized names denoting particular unique organizations, e.g., University of Utah, International Harvester, American Legion, San Francisco Giants, Knights of St. John of Jerusalem.
Qualifier	REAL = Presentable/representable.
Services under real proper-named corporate bodies	IDENTIFIES = gives properties that serve to distinguish named corporate body from others.
	INTERPRETS = adds facts and/or opinions in discursive style.
	LOCATES = gives address of corporate body.
	DATES = gives key dates in the history of, e.g., founding, dissolution.
	QUANTIFIES = gives numerical data that characterize corporate body (e.g., number of members, number of chapters.)

(Services, cont.)

CHRONICLES = gives action-by-action account of newsworthy actions taken by the body or associated with its name (as index term.)

KEY PERSONS = names top officials within organization (past or present, but particularly present ones.)

$ = gives financial data associated with named body, e.g., its dues structure, its annual profit, its gross earnings, etc.

Qualifier

PROPER NAME (as above)

Qualifier

IMAGINARY = representable only.

Services under imaginary proper-named corporate body

IDENTIFIES = gives properties that serve to distinguish named body from others.

DISCUSSES = adds facts and/or opinions in discursive style.

(Other services are subsumed in the two above.)

Qualifier

COMMON NAME = names of classes of corporate bodies (see first definition in this section for examples.)

Services under common-named corporate bodies

DEFINES = gives properties needed for membership in the group designated by common name (Cf. the definition of "international organization" in the Yearbook of International Organizations.)

IDENTIFIES = names (by proper name) members of the group designated by common name (e.g., under automobile manufacturers named Ford Motor Co., American Motors, Chrysler Corp., etc.)

DISCUSSES = adds facts and/or opinions in discursive style.

DATES = gives key dates in the history of a particular type or class of corporate body (e.g., land-grant colleges; underground newspaper companies): its emergence, disappearance, etc.

QUANTIFIES = gives numerical data (excluding financial) that serve to characterize a particular class of corporate body, such as the number of members in the class in various countries, the rate at which the class is growing, etc.

(Services, cont.)

CHRONICLES = gives an action-by-action account of newsworthy developments associated with corporate bodies by common name (e.g., a list of actions taken in the past year by bodies indexed as "College Fraternities.")

$ = gives financial data that serve to characterize corporate bodies by common name.

Qualifiers NOT used with common-named corporate bodies

(REAL))
(IMAGINARY))

Virtually all common-named corporate bodies dealt with by reference works are real.

DATES

Channel entry term	DATES = allows entry by name of period of time of a calendar year or less.
Qualifier	MONTH/DAY = allows entry by name of day when this is designated by the name of a month plus some number between 0 and 32 (e.g., June 15.)
Service under month/ day	CHRONICLES = gives action-by-action account of newsworthy developments associated with that day (e.g., the various celebrities born on it; the various holidays or other observances falling on it.)
Qualifier	YEAR = allows entry by the numerical name of year (e.g., 1066,) using the current Western system of numbering years, and the periods B.C. and A.D.
Service under year	CHRONICLES = gives action-by-action account of newsworthy events of a particular year.
Qualifier	MONTH/DAY/YEAR = allows entry by both indexes named above.
Service under month/ day/year	CHRONICLES = gives action-by-action account of newsworthy events falling on a particular month and day within a particular year.

ERAS

Channel entry term	ERAS = allows entry by name of a period of time of more than a year.
Qualifier	REAL = presentable (as a block of years on the time scale)/representable. E.g., the Flemish Renaissance, the Victorian Age, the Meiji Restoration, the Era of Good Feelings, the Yellow Nineties, the Jurassic Period, Risorgimento.

Service under real eras

DEFINES = gives properties that distinguish named era from others.

DISCUSSES = adds facts and/or opinions in discursive style.

DATES = "frames" era with beginning and ending dates, or otherwise gives significant dates in it.

Qualifier

IMAGINARY = representable only. E.g., the Golden Age, the Millenium.

Functions under imaginary eras

DEFINES = gives properties that distinguish named era from others. These Eras obviously may not be assigned to the same time scale as those called REAL above. They are not in fact datable.

DISCUSSES = adds facts and/or opinions in discursive style.

Two qualifiers NOT used

(proper name)
Virtually all names of eras are proper names.
(common name)

Channel entry term

EVENTS = occurrences that can be fixed between two points on a time scale and that are not reducible either to sets of man-made rules (HUMAN PROCEDURES) or to descriptions of regularies of nature (NATURAL PROCESSES). Although the time scale usually measures past time, it may extend into the future for the prediction of recurrent types of events such as religious holidays, certain fairs and shows, scheduled games, etc.; imaginary events are at best pseudo-datable.

Qualifier

PROPER NAME = names (usually capitalized) or complex actions that are not only unique, but so important as to be recorded for permanent reference, e.g., the American Revolution; the Abdication of Edward VIII. Court cases, such as Brown vs. Board of Education, fit here.

Services under real proper-named events

IDENTIFIES = gives properties that serve to distinguish named event from others.

DISCUSSES = adds facts and/or opinions in discursive style.

LOCATES = shows on a map the physical area identified with an event, or gives enough verbal information that a reader could "place" the event within a map or photograph of the area.

DATES = gives the points on the time scale between which the event occurred or is expected to occur.

QUANTIFIES = gives statistical or other numerical data that characterize named event - e.g., casualty percentages in relation to total fighting forces in all American wars.

CHRONICLES = gives action-by action account of newsworthy developments within the sequence of a large and complex action (whose proper name serves as the index term.) E.g., a listing of major naval engagements in the Pacific during World War II.

$ = gives financial data that serve to characterize named event.

Qualifier

PROPER NAME (as above)

Qualifier

IMAGINARY = representable only. Many religious events, such as the Fall of Man, the Annunciation, the Harrowing of Hell, etc., would seem to fit best here, because in some measure they are outside time. If not imaginary, they have a reality of another order than that designated by REAL above.

Services under imaginary proper-named events

IDENTIFES = gives properties that distinguish named event from others.

DISCUSSES = adds facts and/or opinions in discursive style.

(Other services are subsumed in the two above.)

Qualifier

COMMON NAME = names of classes of events, such as "expenditures," "exports and imports," "battles," "marriages," "felonies," "riots."

Services under common-named events

DEFINES = gives properties needed for membership in the named class.

IDENTIFIES = gives, by proper name, members of named class. (Many such classes do not of course have members with proper names, but some - e.g., on "War" or "Revolution" in general - go here.

LOCATES = shows distribution of a class of events (e.g., "Riots" or "Rodeos") on a map or otherwise clearly associates the class with real places.

DATES = gives key dates in the history of the class - e.g., of aerial dogfights or public executions of criminals.

QUANTIFIES = gives statistical or other numerical data that characterize classes of events. (Many statistical works in the collection fit here.)

CHRONICLES = gives action-by-action account of newsworthy developments indexed under named classes - e.g., news stories indexed under "Marriages."

$ = gives financial data associated with named classes - e.g., amount of money received by U.S. colleges for endowments in 1968.

Qualifiers not used	*(real) (virtually all classes of events in the collection are real.)* *(imaginary)*

FIELDS

Channel Entry Term

FIELDS = spheres of human activity, comprising persons, tools, techniques, products, value systems, standards of conduct, typical environments, awareness of a historical development, and so on. The arts, sciences, professions, occupations (broadly conceived), major sports, academic departments, and organized crime are classes of FIELDS. As a rule, FIELDS have a form of name related to but different from the name of their practitioners (e.g., banking, bankers, of which the former belongs under FIELDS and the latter belongs under REAL COMMON-NAMED PERSONS).

Services

DEFINES = gives aims and characteristic activities that distinguish named field from others

IDENTIFIES = names sub-fields of named field (Cf. the analysis of the sub-fields of "psychology" in the Englishes' Comprehensive Dictionary of Psychological and Psychoanalytical.

DISCUSSES = adds facts and/or opinions in discursive style.

DATES = gives key dates in the history of e.g., genesis, expansions, periods of stability, decline, renaissance, etc.

QUANTIFIES = gives numerical or statistical data that serve to characterize named field.

CHRONICLES = gives action-by-action account of newsworthy developments associated with field.

$ = gives financial data that characterize field (e.g., the annual U.S. expenditure on public elementary education; the annual receipts from legal gambling in Nevada, etc.).

HUMAN PROCEDURES

Channel entry term

HUMAN PROCEDURES = Names of sets of directions for human activities. Persons prescribe behavior for other persons if a certain goal, seen as desirable, is to be reached. Such prescriptive statements are reducible to a step-by-step course of action to be followed (although the works in the collection may fail to present them in such detail).

Statements of HUMAN PROCEDURES are abstracted from events. They convey the way something should be done, not necessarily the way it is done. Thus they differ from the category REAL COMMON NAME EVENTS, which holds what has in fact happened, irrespective of what can be directed. HUMAN PROCEDURES, on the other hand, are formulated in a valued way to go about what, in practice, become events. They purportedly lessen the chance of failure, stigma, penalty, punishment, etc. Examples include recipes for preparing foods, instructions on correct social behavior, analyses of the way products (e.g., steel, whisky, nylon) are properly made. A number of these regularized courses of action constitute the rules and the techniques of the various FIELDS, but are not as extensive as FIELDS.

HUMAN PROCEDURES (like NATURAL PROCESSES) may be expressed in verbal or mathematical form. The formula for figuring compound interest is a HUMAN PROCEDURE expressed mathematically; the formula for describing isotope decay is a mathematically expressed NATURAL PROCESS.

HUMAN PROCEDURES that, when stated, include mechanisms to insure compliance are LAWS in the juristic sense. Such laws are a separate category in this scheme.

As a rule, HUMAN PROCEDURES are intended to be valid any time - not merely between points on a time scale. They may, of course, seem "dated," but that does not invalidate them. Particular LAWS, even when not passed with an explicit termination date, are often repealed later. Hence the sense of DATES below.

A final illustration of points made above may be helpful. Consider the search term "football." If the question implied the world of players, coaches, fans, sportswriters, gate receipts, and

(Channel entry term, cont.)

so on, we would be talking about football as a FIELD. If the question had to do with rules of the game or approved methods of blocking, kicking, etc., we would be talking about HUMAN PROCEDURES. Any particular game would be a REAL COMMON NAME EVENT (or PROPER NAME if our search term was a single game, e.g., Rice-Baylor Game of 1948.) The ball itself would of course be a PRODUCT.

Qualifier

PROPER NAME = names, conventionally capitalized, of particular plans, programs, systems, etc., that have identifiable sponsors (e.g., the Payroll Savings Plan, the Universal Decimal System, the Military Assistance Program.) The capitals suggest uniqueness and a high degree of codification.

Services under proper-named human procedures

IDENTIFIES = gives properties that serve to distinguish the named procedure from others.

DISCUSSES = adds facts and/or opinions in discursive style.

LOCATES = gives address where named procedure is carried out, or of the "headquarters" from which it originates.

DATES = gives key dates in the history of.

QUANTIFIES = gives formulae or numerical or statistical data that characterize named procedure.

CHRONICLES = gives action-by-action account of newsworthy developments associated with procedure (e.g., under "European Recovery Program" in the N.Y.Times Index.)

$ = gives financial data that characterize procedure (e.g., amount spent for U.S. bonds under the Payroll Savings Plan in 1968.)

Qualifier

COMMON NAME = names of types of directable activities without identifiable sponsors (e.g., sorghum-making, lens-grinding, anointing the sick, baroque interpretation of music, automobile exhaust control, pipe-fitting.) Note that these names are frequently verbal phrases used as nouns (i.e., gerunds.) Also plans, programs, etc., by type.

Functions under common name human procedures

DEFINES = gives properties needed for membership in group of actions designated by common name.

IDENTIFIES = names, by proper name, members of group designated by common name (e.g., under "health plans" names particular plans.)

DISCUSSES = adds facts and/or opinions in discursive style. ("How to" articles fit here.)

LOCATES = gives address(es) or shows on a map, where named procedures are carried out.

DATES = gives key dates in the history of.

QUANTIFIES = gives numerical or statistical data, or formulae, that characterize named procedure.

CHRONICLES = gives action-by-action account of newsworthy developments associated with common name procedure.

$ = gives financial data that characterize procedure (e.g., amount spent in 1966 in California on auto exhaust control.)

Two qualifiers NOT used

(REAL) - virtually all procedures named in the collection are real. Such activities as fortune-telling or raising demons involve real procedures, even though practitioners' claims of success would be considered imaginary by many.

(IMAGINARY) - e.g., a speculative account of some procedure of the future in a science yearbook. Accountc of this type are too few in the collection to warrant a special category.

LANGUAGES

Channel entry term	LANGUAGES = human communication systems, involving speech or writing or both. Both verbal and mathematical symbols may be used. The systems may be natural, i.e., created without conscious artifice on anyone's part, or artificial, i.e., deliberately made up by identifiable persons for specific ends. Languages may be living or dead.
Qualifier	PROPER NAME = names of single languages, in which speakers of one dialect understand each other and also speakers of another dialect without grave difficulty. E.g., Potawatami, Afrikaans, Tamil, Danish, Korean. Also such names as COBOL and Esperanto.
Services under proper-named languages	IDENTIFIES = gives properties that distinguish named language from others - e.g., its speakers and their principal geographic area, or, in the case of artificial languages, its origin or intent.
	DISCUSSES = adds facts and/or opinions in discursive style.
	LOCATES = shows on a map the area in which the language is primarily used, or gives sufficient information so that a reader could find the area on a map.
	DATES = gives key dates in the history of.
	QUANTIFIES = gives numerical data that serve to characterize language - e.g., the size of its vocabulary; the number of persons that speak it.
	CHRONICLES = gives action-by-action account of newsworthy developments associated with a named language.
Qualifier	COMMON NAME = names of classes of languages, such as the various stocks and families, such as Amerindian, Indo-Aryan, Semitic.
Services under common-named languages	DEFINES = gives properties needed for membership in the named class.

(Services, cont.)

IDENTIFIES = gives, by proper name, members of named class.

DISCUSSES = adds facts and/or opinions in discursive style.

LOCATES = shows on a map (or relates to a discernable mapped area) a particular class of languages.

DATES = gives key dates in the history of the class.

CHRONICLES = gives action-by-action account of newsworthy developments associated with class, e.g., indexed under "Programming languages."

Qualifiers
NOT used

(REAL)
(IMAGINARY)

LAWS

Channel entry term	LAWS = legislative acts set forth by the body so empowered within a jurisdiction. They typically include mechanisms of enforcement.
Qualifier	PROPER NAME = particular acts that affect particular jurisdictions. Also particular organic acts, such as the U.S. Constitution and the U.N. Charter.
Services under proper-named laws	IDENTIFIES = gives properties that serve to distinguish named law from others (e.g., its provisions and intent.)
	DISCUSSES = adds facts and/or opinions in discursive style.
	LOCATES = gives jurisdiction in which law is (or was) operable.
	DATES = gives key dates in the history of, particularly dates signed or effective date, and (if applicable) date of repeal or abbrogation.
	QUANTIFIES = gives numerical data that serve to characterize law.
	CHRONICLES = gives action-by-action account of newsworthy developments associated with law.
	$ = gives financial data that characterize law (e.g., amount allocated under it for expenditures.)
Qualifier	COMMON NAME = legislative acts by type (e.g., "divorce laws," "homestead laws," "maritime laws.")
Services under common-named laws	DEFINES = gives properties needed for membership in group named by common name.
	IDENTIFIES = names, by proper name, members of the group designated by common name.
	LOCATES = gives jurisdiction in which type of law is operable.
	DATES - gives key dates in the history of type of law.

(Services, cont.)

QUANTIFIES = gives statistics that serve to characterize particular types of law.

CHRONICLES = gives action-by-action account of developments associated with (i.e., indexed under) type of law.

$ = gives financial data that serve to characterize types of law.

Two unused qualifiers

(REAL))
(IMAGINARY)) Virtually all laws dealt with in reference works are real.

LIVING OBJECTS

Channel entry term	LIVING OBJECT = the plant and animal kingdom, including man as an animal.
Qualifier	PROPER NAME = non-taxonomic names of particular plants and animals, e.g., Man-o'-War, the Charter Oak.
Qualifier	REAL = presentable/representable.
Functions under real proper-named living objects	IDENTIFIES = gives properties that distinguish named living object from others.
	DISCUSSES = adds facts and/or opinions in discursive style.
	LOCATES = with plants, shows on a map or gives enough verbal information to permit a reader to find on a map; with animals, gives address of owner.
	DATES = gives key dates in the history of.
	QUANTIFIES = gives numerical data that serve to characterize named living object, e.g., height and circumference of General Grant Tree.
	CHRONICLES = gives action-by-action account of newsworthy developments associated with named living object, e.g., news stories indexed under the name of the Russian space dog Laika.
	$ = gives financial data that characterize named living object, e.g., earnings of various animals in films, race horses, etc.
Qualifier	PROPER NAME (above)
Qualifier	IMANINARY = representable only. E.g,, Pegasus, Babe the Blue Ox, Snoopy.
Services under imaginary proper-named living objects	IDENTIFIES = gives properties that distinguish named (imaginary) living object from others.
	DISCUSSES = adds facts and/or opinions in discursive style.

(Other services are subsumed in the two above.)

Qualifier

TAXONOMIC NAME = Latin name, usually designating genus (capitalized) plus species (lower case) but sometimes including levels above genus, such as order. The intent of course is to avoid the imprecision of names of animals and plants in ordinary language. E.g., timber rattlesnake = Crotalus horridus; European holly = Ilex aquifolium.

Services under taxonomic-named living objects

DEFINES = gives properties needed for membership in the named taxon.

IDENTIFIES = names, in this case, varietal classes that the species level comprises - or gives picture that serves to distinguish named taxon from others.

DISCUSSES = adds facts and/or opinions in discursive style.

Not currently encoded

LOCATES = shows distribution of a particular taxon on a map, or gives enough information to permit a reader to find it on a map.

DATES = gives key dates in the evolution of a particular taxon.

QUANTIFIES = gives numerical data that serve to characterize named taxon.

Qualifier

COMMON NAME = non-latinized, "non-scientific" names of classes of living objects, partitioned as below.

Qualifier

REAL = presentable/representable.

Qualifier

PARTS = components of individual living objects, ranging from the molecular level (but not below) to the level of sub-individual systems, e.g., lipids, bones, the human skeletal system, stamens and pistils, cellulose, carapace, spore, fibrovascular bundles. If the component is regarded as a commerical commodity (e.g., wool, milk, cowhides, fruit juices, nuts, cork) it fits not here but under PRODUCTS. Items here are objects of scientific interest rather than of commerce.

Services under parts of real common-named living-objects

DEFINES = gives properties needed for membership in the named class of parts.

IDENTIFIES = gives subcomponents of a particular part and/or relates the part to the individual living object to which it belongs. Pictures or diagrams often supplement such identification.

DISCUSSES = adds facts and/or opinions in discursive style.

LOCATES = shows spatial relation of part to other parts by graphic means, or gives enough verbal information so that a reader may find the part in a living object or its graphic representation.

DATES = gives key dates in the evolution of.

QUANTIFIES = gives numerical data that characterize named part.

CHRONICLES = gives action-by-action account of newsworthy developments associated with part (e.g., news items indexed under "brain" or "heart").

Qualifier — COMMON NAME (above)

Qualifier — REAL (above)

Qualifier — INDIVIDUAL = living objects at the species level. E.g., tigers, man, box alders, black widow spiders, trilobites, tulips, plankton, goony birds.

Functions under individual real common-named living objects

DEFINES = gives properties needed for membership in the named class.

IDENTIFIES = gives varieties that named class comprises and/or gives picture of "typical" member.

DISCUSSES = adds facts and/or opinions in discursive style.

LOCATES = shows distribution of a particular class of individuals on a map, or gives enough information so that a reader could find it on a map.

DATES = gives key dates in the evolution of.

(Functions, cont.)

QUANTIFIES = gives numerical data that serve to characterize named class. E.g., the range of recorded heights and weights of members of the class man.

CHRONICLES = gives action-by-action account of newsworthy developments associated with named class (e.g., news item about roses or tigers.)

Qualifier

COMMON NAME (above)

Qualifier

REAL (above)

Qualifier

GROUPS = living objects at level more general than that of species, i.e., in which more than one species may be included. E.g., trees, flowers, mammals, shellfish, primates, microbes, ferns, weeds, etc. Named groups are abstractions, in the sense that any member will always have a more specific name than that of the group.

Services under groups of real common-named living objects

DEFINES = gives properties needed for membership in the named group of classes.

IDENTIFIES = gives member classes of the named group, and/or gives pictures of typical representatives of those classes.

LOCATES = shows distribution of a particular group of classes on a map, or gives enough information so that a reader can find on a map.

DATES = gives key dates in the evolution of (group of classes.)

QUANTIFIES = gives numerical data that serve to characterize named group of classes (e.g., estimated populations of various kinds of primates.)

CHRONICLES = gives action-by-action account of newsworthy developments associated with named group of classes (e.g., news items indexed under "insects" or "flowers").

Qualifier

COMMON NAME (above)

Qualifier

IMAGINARY = representable only. E.g., dragons, griffons, unicorns, triffids.

Services under imaginary common-named living objects	DEFINES = gives properties needed for membership in named class. IDENTIFIES = names, by proper name, members of class designated by common name (e.g., names under "monsters" such as King Kong, the Loch Ness Monster, Godzilla). DISCUSSES = adds facts and/or opinions in discursive style.

NATURAL PROCESSES

Channel Entry term	NATURAL PROCESSES = names, capitalized or lower case, of recurrent actions in nature (e.g., photosynthesis, capillary action, alternation of generation, growth, Brownian motion, light, sound, fission, seasickness, blizzards, tsunami, entropy, Bode's law, Raman scatter, etc.). These are names of happenings, considered apart from the less observable happenings that English reifies as the stuff things happen to. NATURAL PROCESSES presumably occur without reference to human goals, and scientists ideally try to omit such reference in describing them. The description may be in verbal or mathematical form. It is abstracted from events, and is intended to be valid (i.e., testable by others) at any time - not merely between two points on a time scale. Descriptions that allow prediction of the future with a very high degree of probability are called laws of nature.
Qualifier	REAL = valid according to the scientific community of the day - or at least useful as a provisional term. (Most terms in the collection fit here.)
Services	DEFINES = names the properties of happenings in nature that are designated by a capitalized or lower case term. Recurrent relationships within a class of happenings may be defined by a mathematical formula, in which case the use of QUANTIFIES is better than DEFINES. DISCUSSES = adds facts and/or opinions in discursive style. LOCATES = shows on a map the locations of types of natural processes (e.g., earthquakes, or typhoons and hurricanes, which occur in some regions and not in others.) To fit here, works must give access to such maps through terms like "earthquakes" or "hurricanes." (Any particular instance of a natural process, e.g., Hurricane Camille, is an EVENT, and should not be considered under NATURAL PROCESSES, which are generalized classes of happenings.

(Services, cont.)

DATES = gives key dates in the history of the statement, verbal or mathematical, of a natural process, e.g., of its appearance, its modification, etc. DATES here has a special sense, relevant to the history of ideas, but not to NATURAL PROCESSES themselves. They seem dateable, if at all, only in a very approximate way (e.g., Hurricane Camille, is an EVENT, and should not be considered under NATURAL PROCESSES, which are generalized classes of happenings).

QUANTIFIES = gives numerical or statistical data, or formulae, that serve to define or characterize some natural process.

CHRONICLES = gives action-by-action account of newsworthy developments associated with named natural process (e.g., see articles indexed under "growth" in N.Y. Times Index.)

Qualifier

IMAGINARY = not valid according to the scientific community of the day. Some discredited terms from older science (e.g., spontaneous generation) and particularly terms from the occult (e.g., levitation, astral influence, telekinesis) fit here - although not irrevocably. Except for Hastings' Encyclopedia of Religion and Ethics, the collection is not rich in pseudoscientific or occult lore, nor does it deal with the vocabulary of science fiction (e.g., hyperdrive, time warp.)

Services under imaginary natural processes

DEFINES = gives the properties of alleged happenings in nature that are merely speculative or that rest on evidence lacking sufficient plausibility to sway informed opinion.

DISCUSSES = adds facts and/or opinions in discursive style.

(Other functions held to be subsumed in the two above.)

NON-LIVING OBJECTS

Channel entry term

NON-LIVING OBJECTS = natural objects, excluding those in the plant and animal kingdoms. Celestial bodies belong in this category, as do submolecular bodies. (The latter are not excepted even though they are components of animals and plants.) Mappable geophysical forms, such as mountains, rivers, seas, deserts, etc., are considered REAL COMMON NAME PLACES, and do not belong here. Many of their components, however, do: e.g., quartz (and all other minerals), air (and all other gases), water (in all its forms), the elements (including the transuranium series, even though they are man-made), and fuels, like coal and petroleum that are residues of former life. Earth, as the indexed name of the planet, goes here because it is often treated with other bodies in space.

Qualifier

PROPER NAME = names of particular, unqiue NON-LIVING OBJECTS, such as Mars or Gemini, Old Faithful (the geyser, not the painting), the Hope Diamond, the sun.

Services under proper named non-living objects

IDENTIFIES = gives properties that distinguish named non-living object from others.

DISCUSSES = adds facts and/or opinions in discursive style.

LOCATES = shows on a map, or gives enough information that a reader could find on a map, or gives celestial coordinates of. Or, for items in collections, such as jewels, gives repository.

DATES = gives key dates in history.

QUANTIFIES = gives numerical data that serve to characterize object.

CHRONICLES = gives an action-by-action account of newsworthy developments associated with non-living object, e.g., news stories indexed under "Moon."

$ = gives financial data that characterize object.

Qualifier	COMMON NAME = names of classes of NON-LIVING OBJECTS.
Qualifier	PARTS = components of all physical objects, ranging from sub-atomic particles to (but not including) the molecular level. E.g., proton, anti-neutrino, positron, and (as an index term) atom.
Services under parts of common named non-living objects	DEFINES = gives properties needed for membership in named class.
	IDENTIFIES = gives subcomponents of a particular part and/or relates to the part of a particular molecule. Graphics may identify here.
	DISCUSSES = adds facts and/or opinions in discursive style.
	DATES = gives key dates in the history of the description, verbal or mathematical, of a PART of a NON-LIVING OBJECT. DATES here has a special sense, relevant to the history of ideas, but not to atoms or sub-atomic particles themselves.
	QUANTIFIES = gives numerical or statistical data, or formulae, that serve to characterize atoms or sub-atomic particles.
	CHRONICLES = gives action-by-action account of newsworthy developments associated with named PART of a NON-LIVING OBJECT, e.g., news stories indexed under "Meson."
Qualifier	COMMON NAME (above)
Qualifier	INDIVIDUAL = physical objects, excluding those with molecular parts classifiable as carbohydrates, fats, proteins, and nucleic acids. The range of objects here comprises the elements and all natural, non-organic compounds. Their names may be "scientific" or popular - e.g., glucose or $C_{16}H_{12}O_6$ or sugar.
Services under individual common name non-living objects	DEFINES = gives properties of elements or of compounds.
	IDENTIFIES = gives members of named group.

(Services, cont.)

DISCUSSES = adds facts and/or opinions in discursive style.

DATES = gives key dates in the history of the description, verbal or mathematical, of GROUPS of NON-LIVING OBJECTS. DATES here has a special sense, relevant to the history of ideas, but not to the named groups themselves.

QUANTIFIES = gives numerical data that serve to characterize named group, e.g., temperatures at which various gases liquify.

CHRONICLES = gives action-by-action account of newsworthy developments associated with GROUPS of NON-LIVING OBJECTS, e.g., news stories indexed under "Rare earth elements."

$ = gives financial data that serve to characterize named group.

PERSONS

Channel entry term	PERSONS = human beings, or beings modeled primarily on the human.
Qualifier	PROPER NAME = Names of unique particular individuals.
Qualifier	REAL = both presentable and representable.
Qualifier	LIVING = living at time of compilation of work.
Services under living real proper-named persons	IDENTIFIES = gives properties of a person (immediately following his name) that serve to differentiate him from anyone else (particularly those with like names). Strings of properties usually comprise, at least, nationality and role (or profession, occupation, etc.). The string may be of any length; if it is non-discursive, it fits here.
	DISCUSSES = adds facts and/or opinions in discursive style.
	LOCATES = gives address of.
	DATES = gives key dates in the life of; e.g., birth and marriage dates.
	QUANTIFIES = gives numerical data serving to characterize the individual person, as height, weight, beauty queen's measurements, etc.
	CHRONICLES = gives action-by-action account of newsworthy developments connected with the person.
	JUDGES = gives opinion on the strengths and weaknesses of the work(s) for which a person is known - e.g., an architect's buildings, a politician's statecraft, a director's films, etc.
	$ = gives financial data about a person, as to his salary, net worth, etc.
Qualifier	PROPER NAME (above)
Qualifier	REAL (above)

Qualifier	DEAD = not living (deceased) at time of compilation of work.
Services under dead real proper-named persons	LOCATES = gives burial place. DATES = gives vital dates. $ = gives financial data about the person, as to his salary, net worth, size of his estate, etc. IDENTIFIES) DISCUSSES) QUANTIFIES) = same as for living real proper-named persons (above) CHRONICLES) JUDGES)
Qualifier	PROPER NAME (as above)
Qualifier	IMAGINARY = representable only. Fictional and mythological persons fit here, including those not strictly human, e.g., angels, demons, gods, trolls, ghosts, elves, Martians, ogres, etc.
Services under imaginary proper-named "persons" *("living" & "dead" are NOT used as qualifiers here)*	IDENTIFIES = gives properties of the person (immediately following his name) that serve to differentiate him from anyone else. (As noted, a "persons" here may be a non-human being.) DISCUSSES = adds facts and/or opinions in discursive style. (Other services are subsumed in the two above.)
Qualifier	CAPITALIZED ROLES = Special kind of common name or class name that designates a conspicuous and important office, held as a rule by only one person at a time. E.g., President of the United States, Archbishop of Canterbury, Speaker of the House of Representatives, Miss America, Governor of Iowa. Such titles are not always capitalized: one sees both "the pope" and "the Popes; but they must be widely known, and occur in questions and in indexes to reference works.
Services under capitalized roles	DEFINES = gives properties associated with the role (e.g., the powers it confers,) irrespective of the incumbent.

(Services, cont.)

IDENTIFIES = gives present incumbent or lists incumbents (probably in chronological order.)

DISCUSSES = adds facts and/or opinions in discursive style.

LOCATES = gives address at which incumbent (in his official capacity, rather than as a private person) may be reached.

DATES = gives key dates in the history of the role, as when it was created, modified, disestablished, etc.

CHRONICLES = gives action-by-action account of developments associated with the role (i.e., indexed under its name.)

$ = gives financial data associated with the role, as the salary it brings.

Qualifiers NOT used with capitalized roles

(real) Virtually all the CAPITALIZED ROLES indexed in the collection are real.

(imaginary) E.g., "Emperor of Eire and Proector of California."

Qualifier

COMMON NAME = capitalized or lower-case names of classes of persons, whether singular or plural in form. Some capitalized classes: Negro, Lutheran, Italians, Rotarians, Les Fauves. Some lower-case classes: women, priests, janitors, families, infants, the handicapped, charlatans, democrats, mankind. Movements (e.g., the Free Speech Movement) and critics' groupings within art, politics, history, etc., (e.g., Dadaists, Decembrists, free-soilers) fit here.

Qualifier

REAL = presentable and representable.

Services under real common-named persons

DEFINES = gives properties needed for membership in group designated by capitalized or lower-case term.

IDENTIFIES = names (by proper name) members of group designated by the common name. In some cases, listing will be exhaustive (e.g., if all six of

(Services, cont.)

Les Six are listed); in others, not (e.g., if, under Decembrists only the most prominent are listed.)

DISCUSSES = adds facts and/or opinions in discursive style.

LOCATES = shows geographic extension of group on a map, or defines boundaries within which the group is generally enclosed.

DATES = gives key dates in the history of, as the formation or disappearance of the group.

QUANTIFIES = gives numerical or statistical data that serve to characterize the group and that are indexed under the group name (e.g., the number of librarians in Poland; the life expectancy of black males and white males in the U.S.; the average heights of Italians from 1850 to 1950. Population figures fit here as access to them is through the name of the group rather than through another element, such as a place name.

CHRONICLES = gives action-by-action account of newsworthy developments associated with the group (i.e., indexed under its name.)

JUDGES = assesses the achievements of a group, particularly of a movement or "school" within the arts, politics, or academic disciplines.

$ = gives financial data associated with and characterizing the group (e.g., average salary for entry-level librarians in the U.S.)

Qualifier

COMMON NAME (as above).

Qualifier

IMAGINARY = representable only.

Services under imaginary common name persons

DEFINES = gives properties needed for membership in group designated by common name (e.g., "kobolds are mischievous, gnomish, subterranean, scruffy, and German." All of these properties are absent from, say, houris.)

IDENTIFIES = names (by proper name) members of group designated by common name (e.g., names the nine muses or the three fates.)

(Services, cont.)	DISCUSSES = adds facts and/or opinions in discursive style.
	(Other services are subsumed in the three above.)

PLACES

Channel term	PLACE NAMES = names of mappable parts of the planet Earth, including political subdivisions. The "world," being mappable, is considered mappable. "Earth," however, is not considered a place name but the name of a NON-LIVING OBJECT among others in space.
Qualifier	PROPER NAME = names of particular unique places or geographic entities.
Qualifier	REAL = presentable/representable.
Services under real proper name place names	IDENTIFIES = gives properties that distinguish named place from others (excluding those properties designated below.)
	DISCUSSES = adds facts and/or opinions in discursive style.
	LOCATES = gives latitude and longitude of, or shows on a map, or names adjacent places that will serve as reference points in consulting a map.
	DATES = gives key dates in the history of.
	QUANTIFIES = gives dimensions of (e.g., height of a mountain, length of a river, area of a state of country), or any other numerical data that serve to characterize a place.
	CHRONICLES = gives action-by-action account of newsworthy developments associated with a political geographical unit (e.g., Germany invades France), or connected with any place name.
	$ = gives financial data connected with place names - particularly geographical units.
Qualifier	PROPER NAME = (above)

IMAGINARY = representable only. Imaginary places are held to be pseudo-mappable - e.g., Middle Earth, Atlantic, Oz, Laputa, Anopopei, Fairyland.

Services under imaginary proper name place names

IDENTIFIES = gives properties that distinguish named place from others.

DISCUSSES = adds facts and/or opinions in discursive style.

(Other services are subsumed in the two above.)

Qualifier

COMMON NAME = all generic names of places (e.g., "cities," "farms," "wildlife refuges," "countries," "lakes," "districts," "parks," "rivers," "oceans," "Metropolitan statistical areas," etc.)

Qualifier

REAL = presentable/representable

Services under real common name places

DEFINES = gives properties needed for membership in group designated by common name.

IDENTIFIES = names (by proper name) members of group designated by the common name.

DISCUSSES = adds facts and/or opinions in discursive style.

LOCATES = shows on a map non-particular, non-unique places (as zones of tundra, areas of varying elevation, areas of varying population density, federally-owned lands in the U.S., ocean zones of varying depths, language areas, land masses covered by ice in the last ice age, migration routed of people in antiquity, flyways of birds, etc.

DATES = gives key dates in the history of group or class designated by common name (e.g., its emergence or disappearance.)

QUANTIFIES = gives numerical data that characterize group designated by common name.

CHRONICLES = gives action-by-action account of newsworthy developments connected with group designated by common name, e.g., "Parks."

	$ = gives financial data that characterize group designated by common name.
Qualifier	COMMON NAME (above)
Qualifier	IMAGINARY = representable only; e.g., paradise.
Services under imaginary common named places	DEFINES = gives properties needed for membership in group designated by common name.
	IDENTIFIES = name (by proper name) members of group designated by the common name.
	DISCUSSES = adds facts and/or opinions in discursive style.
	(Other services are subsumed in the three above.)

	$ = gives financial data that characterize the product (e.g., its total annual earnings in sales, the highest price ever paid for it, etc.)
Qualifier	PROPER NAME (as above)
Qualifier	IMAGINARY = representable only. E.g., Excalibur.
Services under imaginary proper-named products	IDENTIFIES = gives properties that distinguish named product from others. (Some may be traced to superhuman agency.)
	DISCUSSES = adds facts and/or opinions in discursive style.
	(Other services are subsumed in the two above.)
Qualifier	COMMON NAME = all generic names of products, including those beginning with a proper adjective (e.g., French horns, Swiss cheese.)
Qualifier	REAL = presentable/representable.
Services under real common-named products	DEFINES = gives properties needed for membership in group designated by common name.
	IDENTIFIES = names, by proper name, members of group designated by common name (e.g., under "soft drink," the names 7-Up, Coca-Cola, etc.).
	DISCUSSES = adds facts and/or opinions in discursive style.
	LOCATES = gives address(es) associated with class of products (e.g., where made, where sold, where exhibited, etc.)
	DATES = gives key dates in the history of the class of products.
	QUANTIFIES = gives statistics on products by class (e.g., number of tons of steel made in the U.S. annually, liters of beer consumed per year in Belgium etc.)

PRODUCTS

Channel entry term	PRODUCTS = goods made, or in some way acquired, by man as items of wealth. Milk, wool, various crops, etc. are considered PRODUCTS if a work treats them as commodities in commerce; so, too, with minerals and metals. If such items are not treated as commodities, but as objects to be studied in their own right, they belong in LIVING OBJECTS or NON-LIVING OBJECTS (q.v.) "Intellectual products" (e.g., mathematical formulae, laws, poems, sets of rules, etc.) do not belong here either: they fit better in other places in the scheme. Magazines, newspapers, and books, considered solely as commodities DO belong to PRODUCTS. So do artifacts resulting from crafts and minor arts not listed under ART WORKS. Intangible products (e.g., atomic energy, electricity, natural gas) fit here because they are commodities.
Qualifier	PROPER NAME = capitalized names of unique particular products (e.g., ships such as the U.S.S. HANNA) or brand names (Gluxo.)
Qualifier	REAL = presentable/representable.
Services under real proper-name products	IDENTIFIES = gives properties that serve to distinguish named product from others.
	DISCUSSES = adds facts and/or opinions in discursive style.
	LOCATES = gives address(es) associated with the product.
	DATES = gives key dates in history of.
	QUANTIFIES = gives numerical data that characterize the product.
	CHRONICLES = gives action-by-action account of newsworthy developments associated with the product.

	CHRONICLES = gives action-by-action account of newsworthy developments associated with (i.e., indexed under) common names of products.
	$ = gives financial data associated with common names of products, such as the average price of certain grains, by bushel in Chicago last year.)
Qualifier	PROPER NAME (same as above)
Qualifier	IMAGINARY = representable only. E.g., seven-league boots, ray guns, time machine, ghost ship, flying broomsticks.
Services under imaginary common-named products	DEFINES = gives properties needed for membership in class designated by common name.
	DISCUSSES = adds facts and/or opinions in discursive style.

WORDS

Channel entry term

WORDS = all parts of speech when they are used to refer to themselves as words. If a word is used to name itself, it is accented in a special way (vocally) or put in quotation marks (in writing). The reference works that can be entered with WORDS are primarily lexical in nature: dictionaries, concordances, thesauri, etc.

Qualifiers

ABBREVIATIONS = translates abbreviations, acronyms, and initialisms into their full-word form.

FOREIGN TERMS = translates foreign terms into their English equivalents.

SYMBOLS = translates conventional signs and symbols into their verbal counterparts.

NICKNAMES = translates one alternate designation (e.g., a term of familiarity) into another - usually more formal - designation; e.g., The Brown Bomber = Joe Louis; the Windy City = Chicago; Winnie = Winston Churchill.

COMMON NAMES TO TAXONOMIC NAMES = translates the vernacular names of animals and plants into the Latin or scientific classification; e.g., timber rattlesnake = Crotalus horridus; winterberry = Ilex verticillata.

Services

DEFINES = gives the sense(s) in which a word has been meaningfully used. A work must define all parts of speech in order to fit here.

PRONUNCIATION = gives standard (and sometimes variant) sounds of words as spoken.

ETYMOLOGY = gives origin and historical forms of words.

USAGE = discriminates between what the compiler considers proper and improper uses of words (the prescriptive, Fowleresque, Crabbey approach), or shows how persons have actually used the words (the descriptive approach of Webster III). Usage may also mean the labeling of words as colloquial, obsolete, dialect, jargon, vulgar, rare, etc.

(Services, cont.)

SYNONYMS = gives words allied in meaning to the subject word, perhaps discriminating among them as to the shade of meaning each conveys. A work giving synonyms frequently furnishes antonyms as well.

CONTEXT = gives the literary context of words, i.e., the adjacent words or the subject words in famous works, e.g., the Bible, Shakespeare's plays, classic poems, speeches, aphorisms, letters, etc.

SPELLING = has a special section of orthographic rules.

PUNCTUATION = has a special section of punctuation rules.

SUB-COLLECTIONS

SUB-COLLECTIONS = special collections within the basic reference collection. Twenty-nine categories were chosen for the REFSEARCH system. Their function is to unite works that have material on the category as a subject with those that pertain to the category as a field. For example, the *Book of Health* consists of medical subject matter, whereas the *American Medical Directory* has nothing on medicine *per se* but lists physicians and surgeons - persons sharing a field. Another work, the *Research Centers Directory*, lists a certain kind of corporate body in the medical field, among others. All of these works would be grouped together in the sub-collection called MEDICINE, regardless of their physical placement on the shelves.

With highly general works, a decision must be made by the encoder as to whether or not to assign them to all the sub-collections. Non-specialized and non-subject dictionaries are usually assigned to none. General biographical works such as *Who's Who* may also be assigned to none if subject biographies are abundant, because we can fall back on them if a sub-collection which we have specified fails us.

Sometimes a work may be assigned to several (but not all) sub-collections in order to bring certain features to light. In the present system there is no way of giving these elements particular weight, however.

The general categories are:

GOVERNMENT, politics, foreign affairs
LAW
MEDICINE, dentistry, health
PRESS, publishing, public relations
MILITARY
RELIGION
SPORT, hobbies
BUSINESS, commerce, manufacturing
MANNERS, etiquette
AGRICULTURE
MATHEMATICS
PHYSICAL SCIENCES, including chemistry
BIOLOGICAL SCIENCES
SOCIAL SCIENCES
PSYCHOLOGY
ENGINEERING
HISTORIOGRAPHY
PHILOSOPHY
LITERATURE
LANGUAGES, linguistics
THEATER, cinema, dance

(cont.)

MUSIC
PLASTIC ARTS, including architecture
EDUCATION
LIBRARIANSHIP, information science
TRANSPORTATION
COMMUNICATIONS
TOURISM, travel
SOCIAL SERVICES

GEOGRAPHIC CONTROL

GEOGRAPHIC CONTROL = first, geographic boundaries which frame content of work, beyond which the work does not refer. (In a few cases, persons residing beyond these boundaries will be listed in expatriate status.) Second, boundaries enclosing an area on which the work has subject coverage. The first condition must hold for positive coding on any of the terms below; the second may or may not be the case. Titles or indexes will reveal boundaries.

USA = accessible through the name "United States of America" or variant forms such as "American." Also through regions or state of the U.S.A.

CANADA = accessible through the name "Canada" or "Canadian."

UK = accessible through "United Kingdom" and/or "the Commonwealth." Also through any other forms closely linked with "UK": England, English, Great Britain, British, etc. If a work deals with the former colonies of England as colonies, "UK" should be positive.

MULTI-NATIONAL = accessible through the names of many nations. If the USA, or Canada, or UK/Commonwealth is among them, those nations will be marked positively in their own right. MULTI-NATIONAL covers, in other words, countries in addition to the above three.

CONTINENTS = accessible through the names of continents, e.g., North America, Africa, Antarctica. Substantive content on the continents as wholes (not merely on countries) may or may not be present.

WORLD = accessible through the word "World", or purporting to give substantive coverage on a more or less worldwide basis. A map of the world would be a bare minimum here. "Earth" as a synonym for "world" is acceptable only if the work provides substantial coverage on the physical nature of the planet.

Note: Where geographic boundaries are irrelevant to a work, e.g., in the case of a handbook of mathematical tables or a dictionary of scientific terms, the whole matter of GEOGRAPHIC CONTROL may be ignored.

RECENCY

RECENCY = the date of imprint or of copyright of the work in hand. 1970-1969-1968-1967-1966, a five-year span, allows the searcher to call forth anything no more than five years old. If something published within 10 years is acceptable, he may specify 1960. If something within 20 years is acceptable, he may specify 1950. Further back than that, the idea of recency loses force.

A work published in, say, 1969, would be coded positively on 1950, 1960, 1966, 1967, 1968, and 1969, excluding only 1970. Thus any request for a work published within the period 1950 through 1969 would be accommodated, 1959-1960 being a cumulative set.

If the searcher does not care about the RECENCY of a work - that is, cares nothing as to when it was published as long as it gives him the information he seeks - he should ignore RECENCY as an input term in his specification. Any work published before 1950 will, of course, be negative along the entire RECENCY range.

1970

1969

1968

1967

1966

1960

1950

SPECIAL SERVICES

Graphics

GRAPHICS = some sort of illustrative material present (not necessarily in profusion.)

PROFUSE = illustrations on most pages - or otherwise numerous.

COLOR USED = some, if not all, graphics in color.

ATLAS = bulk of work devoted to maps.

NON-ATLAS WITH MAPS = bulk of work not devoted to maps, although some maps are scattered through the text or presented in a special section.

CHARTS = has schematized graphic representation of ideas. Does not apply to nautical charts (see "maps" above.)

DIAGRAMS = has schematized line drawings of objects.

PORTRAITS = has pictures of faces (as a standard feature.)

ARCHITECTURAL PLANS = has renderings of floor plans and/or elevations.

Bibliographic services

WRITINGS BY (subject of entry) = names literary (or musical) works by an author (or composer) either in text about him or at the end of it.

WRITINGS ABOUT (subject of entry) = names works to consult for further information on whatever is entry topic (person, place, product, etc.), either in or at the end of the article.

SOURCES = lists writings from which work in hand has derived material. (In some cases, such listing adds to the authority of a work in the eyes of reference librarians.

SERIALS = names serial publications of corporate bodies (e.g., the newsletter of a political group, the journal of a scholarly society, the youth magazine of a church.)

(Services, cont.)	GENERAL BIBLIOGRAPHY = lists writing pertaining to work as a whole or to a wide range of subject matter. (WRITINGS BY and WRITINGS ABOUT are bibliographies attached to articles in works, not works themselves.)
Picture service	PICTURES BY (subject of entry) = names works by pictorial artist (e.g., "Guernica" by Picasso.) PICTURES OF (subject of entry) = names and locates picture of whatever is the entry topic. (Note: if a work contains pictures, it will be coded positively under GRAPHICS. If it indexes pictures, it will be coded positively under either or both of the terms immediately above. Works that index pictures do not necessarily contain them.)

Miscellaneous

COMPARATIVE/SUPERLATIVE RATINGS = text structured to provide quick access to comparative and superlative degrees of descriptive terms (e.g., the fastest man in the 100-yard dash, the deepest lake, the higher of two mountains, the top ten states in the U.S.A. in annual expenditures per public school pupil, etc.)

DOCUMENTS IN FULL = provides full text(s) of one or more documents (or major sections thereof). Reprints, for example, the Declaration of Independence, the U.S. Constitution, the U.N. Chart - documents of high historical interest and significance.

GENEALOGICAL TABLES = has tables showing parentage, marriage, offspring, etc., of famous persons.

ITEMS OF STATE = has, in ready-reference format, conventional items of interest about a state or nation, as (in the U.S.A.) state bird, flower, song, land area, population, capital, etc.; (with foreign nations) unit of currency, language(s), holidays, flag, anthem, etc.

NEWS-RELATED = serial, concerned with current events in general, and having a range of coverage roughly coextensive with that of a metropolitan daily newspaper.

FICTIONAL NAMES = gives names of persons, places, things, etc., that were consciously created by one artist (or collaborators acting as one) as part of an imaginary "world" in poetry, drama, the novel, the cinema, etc.

MYTHOLOGICAL NAMES = gives names of persons, places, things, etc., that were created not by any identifiable artist(s), but by anonymous persons over a long period of time - not as conscious "fictions," but as the "higher reality" of the group.

TIME SPAN

TIME SPAN = the period(s) to which the substantive matter in a reference work can best be related. Sometimes this span is marked by an explicit *terminus a quo* and *terminus ad quem.* Often, however, the terminal dates of a work must be inferred. If, for instance, it contains material on Ur, Cro-Magnon man, the Doric migrations, and the Emperor Tiberius, it should be positively coded on ANTIQUITY even though its editors do not state that they deal with times before 400 A.D.

Some works range in temporal coverage from pre-history almost to their imprint date; others deal with one year only (usually the one shown on their spine, or the year preceding.) There are, of course, many other possibilities as well.

When TIME SPAN seems unimportant or inappropriate in characterizing a work, the coding should be negative along that entire range.

ANTIQUITY = pre-history to c. 400 A.D.

MIDDLE AGES = c. 401 to 1400 A.D.

15th CENTURY
16th CENTURY
17th CENTURY
18th CENTURY
19th CENTURY
= self-evident. A work that covers, e.g., the 19th century through, say, 1860, is coded 19TH CENTURY as if it covered the entire period.

1901-10
1911-20
1921-30
1931-40
1941-50
1951-60
1961-65
= the decades allow more precision in coding than the centuries, but still may be only approximate. E.g., a work that terminates its coverage in 1945 would be coded 1941-1950, as if it covered the whole decade. (Exact dates are given in the descriptive headings of the syllabus sheets.)

1966
1967
1968
1969
1970 TO DATE
= still more precise possibilities to take care of the various recent yearbooks, biennials, etc. This part of the scale requires more frequent maintenance.

FUTURE DATES = for certain events that predictably occur (e.g., Ash Wednesday, Easter,) some works give dates in advance. FUTURE DATES may also be used if a work deals speculatively with the future (e.g., has an article on interstellar flight) or if it deals with mythological or religious matter of a "timeless" character.

20TH CENTURY = used with works that cover the whole of this century through 1960 or later - or, for slowly changing fields, through 1950.

PART IV

CLASSIFIED INDEX, CODING KEY, AND SOURCE LISTS

REFSEARCH Classified Index 86-92
REFSEARCH Coding Key 93-96
Alphabetical List of Works 97-99
List of Works in File Order (by form) 100-104

REFSEARCH INDEX

Code	Channels/Qualifiers/Services*	Number of works coded positively
201**	WORDS	68
206	SYNONYM/ANTONYM	12
208	SLANG	8
209	ABBREVIATIONS	34
210	FOREIGN TERMS	24
211	SIGNS/SYMBOLS	11
212	NICK/READ NAME	15
215	COMMON/SCIENTIFIC NAME	10
202	defines	42
203	pronounces	19
204	etymology	14
205	usage	13
207	context	6
213	spelling	4
214	punctuation	8
217	FIELDS	58
	(QUALIFIERS NOT USED)	
222	discusses	31
224	dates	24
225	quantifies	16
226	chronicles	7
227	$	13
223	NATURAL PROCESSES	41
236	REAL	41
237	IMAGINARY	5
238	discusses	20
240	dates	41
241	quantifies	19
242	chronicles	41

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* Elements in upper case, underlined, are channel entry terms; those not underlined are qualifiers; those in lower case represent services.

** Channel entry terms can be omitted if terms relating to them are used.

Code	Channels/Qualifiers/Services	Number of works coded positively
249	NON-LIVING OBJECTS	46
250	PROPER NAME	23
251	COMMON NAME	45
254	PART	13
255	INDIVIDUAL	45
256	GROUP	38
257	identifies	16
258	discusses	17
259	locates	4
260	dates	9
261	quantifies	14
262	chronicles	7
263	$	11
301	PLACES	79
302	PROPER NAME	76
303	COMMON NAME	28
304	REAL	79
305	IMAGINARY	22
306	identifies	29
307	discusses	27
308	locates	27
309	dates	22
310	quantifies	28
311	chronicles	11
312	$	16
317	LIVING OBJECTS	52
318	PROPER NAME	18
319	COMMON NAME	51
320	REAL	50
321	IMAGINARY	18
322	PART	27
323	INDIVIDUAL	45
324	GROUP	42
325	identifies	17
326	discusses	22
327	locates	1
328	dates	5
329	quantifies	16
330	chronicles	7
331	$	8

Code	Channels/Qualifiers/Services	Number of works coded positively
333	PERSONS	109
334	PROPER NAME	92
338	COMMON NAME	64
339	REAL	108
340	IMAGINARY	25
341	LIVING	73
342	DEAD	64
335	INDIVIDUAL	60
336	CAPITALIZED GROUP	48
337	CAPITALIZED ROLE	26
343	identifies	80
344	discusses	40
345	locates	21
346	dates	69
347	quantifies	16
348	chronicles	7
349	criticizes	21
350	$	15
417	HUMAN PROCEDURES	68
418	PROPER NAME	39
419	COMMON NAME	66
422	discusses	41
423	locates	3
424	dates	32
425	quantifies	17
426	chronicles	6
427	$	9
401	ART WORKS	47
402	PROPER NAME	40
403	COMMON NAME	32
406	identifies	39
407	discusses	30
408	locates	13
409	dates	35
410	quantifies	5
411	quantifies	4
412	chronicles	14
413	$	4

Code	Channels/Qualifiers/Services	Number of works coded positively
357	PRODUCTS	65
358	PROPER NAME	16
359	COMMON NAME	63
360	REAL	65
361	IMAGINARY	11
362	PART	9
363	INDIVIDUAL	44
364	GROUP	39
365	identifies	16
366	discusses	28
367	locates	4
368	dates	23
369	quantifies	16
370	chronicles	7
371	$	15
433	CORPORATE BODIES	80
434	PROPER NAME	69
435	COMMON NAME	60
436	REAL	80
437	IMAGINARY	8
446	PROFIT	29
447	NON-PROFIT	58
448	INTERNATIONAL ONLY	4
438	identifies	53
439	discusses	35
440	locates	30
441	dates	42
442	quantifies	24
443	chronicles	10
444	key person	38
445	$	26
519	LAWS	55
502	PROPER NAME	38
503	COMMON NAME	55
202	defines	42
257	identifies	16
506	discusses	35
508	dates	25
509	quantifies	13
510	chronicles	6
371	$	15
537		
537	LANGUAGES	49
	(QUALIFIERS NOT USED)	
	(services same as for LAWS, less $)	

Code	Channels/Qualifiers/Services	Number of works coded positively
501	CONCEPTS	55
502	PROPER NAME	38
503	COMMON NAME	55
506	discusses	35
508	dates	25
509	quantifies	13
510	chronicles	6
449	EVENTS	58
450	PROPER NAME	37
451	COMMON NAME	46
454	identifies	28
455	discusses	28
456	locates	30
457	dates	37
458	quantifies	20
459	chronicles	10
460	$	16
462	DATES	16
463	MONTH/DAY	8
464	YEAR	11
465	chronicles	14
468	ERAS	36
469	REAL	36
470	IMAGINARY	13
471	discusses	26
472	dates	30
(557)	GEOGRAPHIC CONTROLS	124
558	USA	113
559	CANADA	70
560	UK/COMMONWEALTH	71
561	MULTI-NATIONAL	70
562	CONTINENTAL	33
562	WORLD	14

Code	Channels/Qualifiers/Services	Number of works coded positively
(517)	SUBCOLLECTIONS	126
518	GOVERNMENT	50
519	LAWS	52
520	MEDICINE	51
521	PRESS	45
522	MILITARY	43
523	RELIGION	53
524	SPORT	36
525	BUSINESS	52
526	MANNERS	26
527	AGRICULTURE	49
528	MATHEMATICS	41
529	PHYSICAL SCIENCE	48
530	BIOLOGICAL SCIENCE	48
531	SOCIAL SCIENCE	46
532	PSYCHOLOGICAL SCIENCE	44
533	ENGINEERING	42
534	HISTORY	31
535	PHILOSOPHY	40
536	LITERATURE	50
537	LANGUAGES	49
538	THEATER	41
539	MUSIC	41
540	PLASTIC ARTS	46
541	EDUCATION	55
542	LIBRARIANSHIP	46
543	TRANSPORTATION	47
544	COMMUNICATIONS	46
545	TOURISM	28
546	SOCIAL SERVICES	43
	SPECIAL SERVICES	
601	GRAPHICS	59
602	PROFUSE GRAPHICS	17
603	GRAPHICS WITH COLOR	19
604	ATLAS	3
605	WITH MAPS	29
606	CHARTS/DIAGRAMS	30
607	PORTRAITS	9
608	ARCHITECTURAL PLANS	11
617	BIBLIOGRAPHY	94
618	WRITINGS BY	46
619	WRITINGS ABOUT	44
620	GENERAL BIBLIOGRAPHY	18
621	SOURCES	15
622	SERIALS BY	17
625	PICTURE INDEX	19
626	PICTURES BY	15
627	PICTURES OF	10

Code	Channels/Qualifiers/Services	Number of works coded positively
(649)	TIME SPAN	92
650	ANTIQUITY	39
651	MIDDLE AGES	39
652	15TH CENTURY	46
653	16TH CENTURY	48
654	17TH CENTURY	55
655	18TH CENTURY	58
656	19TH CENTURY	63
669	20TH CENTURY	70
657	1901-1910	69
658	1911-1920	68
659	1921-1930	68
660	1931-1940	66
661	1941-1950	59
662	1951-1960	39
663	1961-1965	33
664	1966	25
665	1967	22
666	1968	11
667	1969 to date	6
668	FUTURE DATES	55
(641)	RECENCY	131
643	1969	25
644	1968	51
645	1967	66
646	1966	74
647	1960	114
748	1950	130
(633)	MISCELLANEOUS CONTROLS	531
634	COMPARATIVE/SUPERLATIVE	7
635	DOCUMENTS	9
636	FICTITIOUS NAMES	17
637	MYTHOLOGICAL NAMES	31
638	NEWS-RELATED	10
639	ITEMS OF STATE	8
640	GENERAL TABLES	4

REFSEARCH CODING KEY

201 WORDS
202 defines *(applies pro tem to LAWS as well)*
203 pronounces
204 etymology
205 usage
206 synonym/antonym
207 context
208 slang
209 abbreviations
210 foreign terms
211 signs/symbols
212 nicknames
213 spelling
214 punctuation
215 scientific names
216
217 FIELDS
218
219
220
221
222 discusses
223 locates
224 dates
225 quantifies
226 chronicles
227 $
228
229
230
231
232
233 NATURAL PROCESSES
234
235
236 real
237 imaginary
238 discusses
239 locates
240 dates
241 quantifies
242 chronicles
243
244
245
246
247
248
249 NON-LIVING OBJECTS
250 proper

(NON-LIVING OBJECTS, cont.)
251 common
252
253
254 part
255 individual
256 group
257 identifies
258 discusses
259 locates
260 dates
261 quantifies
262 chronicles
263 $
264
265
266
267
268
269
270
271
272

301 PLACES
302 proper
303 common
304 real
305 imaginary
306 identifies
307 discusses
308 locates
309 dates
310 quantifies
311 chronicles
312 $
313
314
315
316
317 LIVING OBJECTS
318 proper
319 common
320 real
321 imaginary
322 part
323 individual
324 group
325 identifies
326 discusses

(LIVING OBJECTS, cont.)
327 locates
328 dates
329 quantifies
330 chronicles
331 $
332 *taxonomic*
333 PERSONS
334 proper
335 individual
336 capitalized group
337 capitalized role
338 common
339 real
340 imaginary
341 living
342 dead
343 identifies
344 discusses
345 locates
346 dates
347 quantifies
348 chronicles
349 judges
350 $
351
352
353
354
355
356
357 PRODUCTS
358 proper
359 common
360 real
361 imaginary
362 part
363 individual
364 group
365 identifies
366 discusses
367 locates
368 dates
369 quantifies
370 chronicles
371 $
372

Also applies pro tem to LAWS

401 ART WORKS
402 proper
403 common
404
405
406 identifies
407 discusses
408 locates

(ART WORKS, cont.)
409 dates
410 quantifies
411 chronicles
412 judges
413 $
414
415
416
417 HUMAN PROCEDURES
418 proper
419 common
420
421
422 discusses
423 locates
424 dates
425 quantifies
426 chronicles
427 $
428
429
430
431
432
433 CORPORATE BODIES
434 proper
435 common
436 real
437 imaginary
438 identifies
439 discusses
440 locates
441 dates
442 quantifies
443 chronicles
444 key person
445 $
446 profit
447 non-profit
448 international only
449 EVENTS
450 proper
451 common
452
453
454 identifies
455 discusses
456 locates
457 dates
458 quantifies
459 chronicles
460 $
461
462 DATES
463 month/day

(DATES, cont.)

464	year	
465	chronicles	
466		
467		
468	ERAS	
469		
470	imaginary	
471	discusses	
472	dates	
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PART V - AUTOMATIC RETRIEVAL PROCEDURES

The following operational procedures are in effect for the REFSEARCH program as currently implemented in the Information Processing Laboratory, using the Sanders cathode-ray-tube terminals:

1. After logging in a display, the following will appear:

```
TMS102I-'NAME' LOGGED IN
TMS 104A-SPECIFY PROGRAM
```

press	"CLEAR" Key
press	"TYPE" Key
type	*REFSRC*
press	"SEND BLOCK" Key

2. The following display will result:

```
  LAB REFERENCE WORKS SEARCH PROGRAM

THE FOLLOWING COMMANDS ARE AVAILABLE IN THIS PROGRAM:

1.  ENTER QUERY IN ENCODED FORM:
        SEPARATE INDIVIDUAL ITEMS BY COMMAS (BLANKS OPTIONAL).
        ASSIGN WEIGHTS (OPTIONAL) AS SINGLE, NON-ZERO DIGITS
           PRECEDED BY A DASH, E.G. '203-6'.
        END OF QUERY IS IMPLIED WHEN YOU HIT 'SEND BLOCK'.
2.  EDIT   - WILL DISPLAY THE QUERY FOR EDITING
3.  LIST   - WILL DISPLAY THE WHOLE COLLECTION OF DOCUMENTS
4.  LIST N - WILL DISPLAY COLLECTION OF DOCUMENTS STARTING WITH THE N'TH.
5.  START  - WILL DISPLAY THIS SCREEN AGAIN.
6.  EXIT   - WILL RETURN CONTROL TO THE MONITOR.
>_
```

(Explanatory notes - next page)

(Notes to basic REFSEARCH idsplay, preceding page)

(query) (1) Use three-digit codes from the Classified Index of Terms (Part IV of this Manual). The system will deal with as many as twelve of these, in any order, in a single specification. If the user specifies more than twelve, the following error message will appear on the screen:

TOO MANY TERMS IN THIS QUERY. RESUBMIT.

If any one of the codes contains more than or less than three digits, or
If it corresponds with no code number in the Index, or
If it contains embedded blanks, or
If the user inputs characters instead of numbers, and the character do not spell one of the commands (numbered 2 through 6 in the display) then
The following display will appear:

```
  L A B  R E F E R E N C E  W O R K S  S E A R C H  P R O G R A M

  888   ...INVALID CODE. CORRECT IT NOW.

> 318,326,888,617_
```

(where "318" and "326" have been accepted, "888" has been found invalid, and "617" has not yet been checked)

In the above case, or if the user is aware of an error before sending his specification in the first place, he may correct anything to the right of the carat (>) by moving the cursor (_) to the offending character(s) and overtyping, deleting, or inserting.

Currently the assignment of weights to coded terms has no effect on the ordering of retrieved titles, because the file has not yet been revised to reflect weighted factors. However, the user may observe typical program reaction to this kind of query by trying it out. It will be found that the user cannot mix weighted terms with unweighted terms. The error message for this is

INCONSISTENT WITH TERM WEIGHT USAGE

When weighted terms are used, the program looks only at the first alphanumeric character following the hyphen. Thus "203-22" is read as "203-2". If the user mistakenly follows the hyphen with a letter, he gets the following error message:

TERM WEIGHT MUST BE A DIGIT

None of the reactive displays mentioned above and on the preceding page will occur until after the "SEND BLOCK" key is pressed.

BE SURE TO USE THE NUMERAL "1" ON YOUR KEYBOARD TO REPRESENT 1. TO THE COMPUTER, "L" IS AN L.

("EDIT") (2) This is an extremely useful command in that it can be used after a retrieval has been made and displayed, permitting the user to revise his specification without having to retype it in its entirety. "EDIT" may also be invoked part way through a multi-page retrieval display, in which case the remainder of the display is cancelled.

The edit-ready display presents the user with the most recent form of his specification, with carat and cursor:

```
>312,326,617_
```

("LIST") (3) Documents are displayed in file order sequence, in twelve consecutive "pages" of twelve titles each. Pages are advanced by pressing "SEND BLOCK." The sequence can be interrupted at any time by an overriding command. (A printed copy of this same list, grouped by form, is furnished on pages 100-104 of this Manual.)

THE FORMS OF TITLES ARE NOT AUTHORITATIVE: THEY ARE SIMPLY VERSIONS THAT WERE ADOPTED FOR READY SCANNING BY THE USER.

("LIST N") (4) In using this command, substitute a number from 1 to 144 for *"N"*. The titles displayed will be limited to those having file numbers the same as or greater than the specified integer. Displays of more than twelve titles are advanced in the same way as with plain *LIST*.

("START") (5) Repeats basic REFSEARCH display (page 105). Does not eradicate current specification, if any.

("EXIT") (6) Self-explanatory.

3. Whatever the user types in response to the basic REFSEARCH display will appear on the screen as he types it, to the right of the carat (q.v.). The cursor will always indicate the location of the next input character.

When input is complete -

press "SEND BLOCK" Key

This is the standard signal for the computer to process whatever has been input by the user, if it can. Even if nothing has been typed in, processing will occur (e.g., display of new "page" in a long list).

4. A typical display resulting from standard (not weighted) input is shown below. (Assume input of *506, 523* - meaning "Required: a work that discusses religion.")

```
L A B  R E F E R E N C E  W O R K S  S E A R C H  P R O G R A M

                 16 DOCUMENTS SATISFY THIS REQUEST

506          025   OXFORD CLASSICAL DICTIONARY
             028   LAROUSSE WORLD MYTHOLOGY
523          036   YEARBOOK OF AMERICAN CHURCHES
             059   INTERPRETER'S DICTIONARY OF THE BIBLE
             061   BRITANNICA BOOK OF THE YEAR
             130   NEW SCHAFF-HERZOG ENCYCLOPEDIA OF RELIGIOUS KNOWLEDGE
             131   TWENTIETH CENTURY ENCYCLOPEDIA OF RELIGIOUS KNOWLEDGE
             132   NEW CATHOLIC ENCYCLOPEDIA
             133   THE JEWISH ENCYCLOPEDIA
             134   HASTINGS' ENCYCLOPEDIA OF RELIGION AND ETHICS
             135   ENCYCLOPEDIA OF PHILOSOPHY
             136   ENCYCLOPEDIA OF WORLD ART
_
```

Observing that only twelve of the sixteen retrieved titles have been displayed, the user may press "SEND BLOCK" and get a new page:

```
L A B  R E F E R E N C E  W O R K S  S E A R C H  P R O G R A M

                 16 DOCUMENTS SATISFY THIS REQUEST

506          138   INTERNATIONAL ENCYCLOPEDIA OF SOCIAL SCIENCE
             140   ADAMS. DICTIONARY OF AMERICAN HISTORY
523          143   COLLIER'S ENCYCLOPEDIA
             144   THE COLUMBIA ENCYCLOPEDIA

>_
```

(Notes to retrieval display, preceding page)

(1) The numbers on the left repeat the specification.

(2) The numbers aligned with the titles are their file or "accession" numbers.

(3) A rough ranking of retrievals according to specialty is attained by virtue of the fact that the file is ordered in a particular way. This ranking should not be construed as being prescriptive in the degree that a weighted retrieval might be.

(4) The cursor appears in the lower left-hand corner of the screen in all retrievals. The carat appears, preceding the cursor, only on the last page of a multi-page retrieval. This does not mean, however, that the user cannot type anything until the carat appears. He may interrupt the progression at any page by typing in a new specification, or by calling for "EDIT", "LIST", "LIST N", "START", or "EXIT", i.e., any of the commands listed in the basic REFSEARCH display.

5. The output from "LIST" is interruptible at any page, in the same way as described in 4(4) for retrievals, above.

6. It is good practice always to do an "EXIT" before leaving the terminal at the end of a session. This leaves no doubt in the mind of the next user as to whether the terminal is free.

PART VI - EXAMPLES

The examples given in the pages which follow illustrate some of the ways in which specifications can be derived from negotiated questions, and the results obtained through use of the machine-assisted approach program.

They are also intended to serve as basic material upon which students can experiment in a number of ways. Little purpose is served simply by having the machine verify the responses already listed, but a number of interesting operations can be carried out with the questions and specifications as starting points. Some of these are suggested below:

1. Based on a given specification, and ignoring or concealing the machine results posted below it, the student might execute a mental retrieval from his own current understanding of the characteristics of the works studied to date; write down the titles; and then compare the list with the machine results.

2. Does the machine retrieval include works which the student had not previously considered as possible sources of the specified data? If so, is it because these works have not yet been studied, or is it because the student may have overlooked a service/data potential? In the latter case, he will want to check the work itself at the first opportunity.

3. Does the list yielded by the machine omit a work which the student believes should have been retrieved? If so, which term(s) of the specification caused its exclusion? Was the exclusion legitimate, or was it caused by the coders having failed to recognize a certain characteristic properly? Or - still another possibility - does the indexing of the work itself prohibit access via the chosen "handle" or its equivalent? (This is an important point that was taken into consideration in the coding.) In any case, the student will want to check the physical works to make a determination.

4. Now the student might go back to the question and set up a specification on slightly different terms, put it in the machine, and observe the results. What was the effect of the change, and why did it take place? Can he add elements that will limit the number of retrievals without excluding the most promising sources? Can he strip away elements without getting too large a list from the machine, i.e., so many titles that the result would not be of much use to a searcher?

5. Going back to the basic question, the student might try to pick an alternate "handle" that would get him into a channel different from that used in the example. This is perfectly reasonable, especially if he is unhappy with results of the treatment suggested in the example. He can then observe and compare the results of the new approach, and decide (by recourse to the works again, if necessary) why they differed, and which approach was the more effective.

6. Or the student can try altering elements of the question itself to see how such an alteration affects the results. One way of ascertaining the reason for shifts in the identity of retrieved works is to consult the computer-listing of works, and their characteristics as coded, which is kept in the Informational Processing Laboratory.

The specifications suggested in the examples do not purport to be uniformly the best that can be devised, and it is probable that students will be able to restate some of them in terms that will give more precise and appropriate results. It is also probable that students will turn up discrepancies in the basic coding, and these of course should be brought to the attention of the instructor or lab assistant so that the file can be continually upgraded and made more reliable. However, retrievals should not be rejected out of hand because they look ridiculous. For instance the specification in Example #20 requires a work that discusses librarianship; yet it retrieves the *Kirk-Othmer Encyclopedia of Chemical Technology;* actually this work contains an article on the relationship of documentation to library science. In encoding the collection, a number of such hidden - or generally unrecognized - riches were discovered.

Certain works, it will be observed, turn up with monotonous regularity because their coding has been so inclusive, e.g., the New Catholic Encyclopedia and the Colliers Encyclopedia. They were included in the collection mainly to demonstrate encyclopedic services - (1) of a general work, and (2) of a general work with some religious bias. Since they are always listed last in any retrieval, the user can ignore them if he wishes.

REFSEARCH EXAMPLES

1. Question: Who played Mr. Robinson in the film *The Graduate?*

Handle: *THE GRADUATE*

Channel entry term:	art works	(401)*
Service required:	discusses	407
Qualifier:	proper-named	402
Qualifier (subcol.):	theater	538
Special service:	1968 recency	644

Specification: "Required: a work that $\underset{407}{\underline{\text{discusses}}}$ $\underset{402}{\underline{\text{proper-named}}}$ $\underset{538}{\underline{\text{theatrical}}}$ $\underset{(201)}{\underline{\text{art works}}}$ (productions). Must be no less recent than $\underset{644}{\underline{\text{1968}}}$."

Result: 3 works retrieved -

FILMFACTS
BRITANNICA BOOK OF THE YEAR
COLLIERS ENCYCLOPEDIA

2. Question: What kind of game is played on a cancha?

Handle: CANCHA

Channel entry point:	words	(201)
Service required:	defines	202
Qualifier (subcol.):	sports	524

Specification: "Required: a work that $\underset{202}{\underline{\text{defines}}}$ $\underset{(201)}{\underline{\text{words}}}$ dealing with $\underset{524}{\underline{\text{sport}}}$."

Result: 6 works retrieved -

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* ( ) = implied by one of the services or qualifiers; not input.

(List of retrievals for #2, preceding page)

CUMMINGS DICTIONARY OF SPORTS
OXFORD CLASSICAL DICTIONARY
BRITANNICA BOOK OF THE YEAR
NEW CATHOLIC ENCYCLOPEDIA
COLLIERS ENCYCLOPEDIA
COLUMBIA ENCYCLOPEDIA

3. Question: What was the life expectancy, at birth, for both sexes born in the U.S. in 1960?

Handle:	LIFE EXPECTANCY	
Channel entry term:	natural processes	(233)
Service required:	quantifies	241
Qualifier:	real	236
Qualifier (subcol.):	biology	530
Qualifier (time span):	1951-1960	662
Special control:	U.S.A.	558
Special control:	1966 recency	646

Search specification: "Required: a work that $\underset{241}{\underline{\text{quantifies}}}$ $\underset{236}{\underline{\text{real}}}$

$\underset{(233)}{\underline{\text{natural processes}}}$ in $\underset{530}{\underline{\text{biology}}}$ in the $\underset{558}{\underline{\text{U.S.A.}}}$

The work must cover the years $\underset{662}{\underline{\text{1951-1960}}}$, and

be no less recent than $\underset{646}{\underline{\text{1966}}}$."

Result: 6 works retrieved -

STATISTICAL ABSTRACT OF THE UNITED STATES
HARPER'S ENCYCLOPEDIA OF SCIENCE
WORLD ALMANAC
NEW CATHOLIC ENCYCLOPEDIA
ENCYCLOPEDIA OF PHILOSOPHY
COLLIERS ENCYCLOPEDIA

4. Question: What did Nero say on the occasion of his death?

Handle: NERO

Channel entry term:	persons	(333)
Service required:	discusses	344
Qualifier:	dead	342
Qualifier:	real	339
Qualifier:	individual	335
Qualifier:	proper-named	334
Qualifier (subcol.):	government	518
Qualifier (time span):	antiquity	650
Special control:	multi-national	561

Search specification: "Required: a work that $\underset{344}{\underline{\text{discusses}}}$ $\underset{339}{\underline{\text{real}}}$, $\underset{342}{\underline{\text{dead}}}$, $\underset{334}{\underline{\text{proper-named}}}$ $\underset{335}{\underline{\text{individuals}}}$. The work must deal with $\underset{561}{\underline{\text{multi-national}}}$ $\underset{518}{\underline{\text{government}}}$ figures of $\underset{650}{\underline{\text{antiquity}}}$."

Result: 7 works retrieved -

OXFORD CLASSICAL DICTIONARY
LANGER. ENCYCLOPEDIA OF WORLD HISTORY
NEW CATHOLIC ENCYCLOPEDIA
ENCYCLOPEDIA OF PHILOSOPHY
INTERNATIONAL ENCYCLOPEDIA OF THE SOCIAL SCIENCES
COLLIERS ENCYCLOPEDIA
COLUMBIA ENCYCLOPEDIA

5. Question: What tribe was located around present-day Canterbury in Roman times?

Handle: CANTERBURY

Channel entry term:	(blank)	
Special service:	with atlas	604
Special control:	UK/Commonwealth	560
Qualifier (time span):	antiquity	650

Search specification: "Required: a work providing an $\underset{604}{\underline{\text{atlas}}}$ covering

(Search specification for #5, preceding page, cont.)

an area that is now in $\underset{560}{\underline{\text{UK/Commonwealth}}}$,

during $\underset{650}{\underline{\text{antiquity}}}$."

Result: 1 work retrieved -

SHEPHERD'S HISTORICAL ATLAS

6. Question: What is the name of the airline which early this year was authorized to schedule service between Miami and San Salvador?

Handle: AIRLINE

Channel entry term:	corporate bodies	(433)
Service required:	identifies	438
Qualifier:	profit	446
Qualifier:	real	436
Qualifier:	common-named	435
Qualifier (subcol.):	transportation	543
Special control:	1969 recency	643
Special control:	multi-national	561

Search specification: "Required: a work that $\underset{438}{\underline{\text{identifies}}}$ $\underset{436}{\underline{\text{real}}}$,

$\underset{435}{\underline{\text{common-named}}}$, $\underset{446}{\underline{\text{profit}}}$-oriented, $\underset{(433)}{\underline{\text{corporate}}}$

bodies dealing with $\underset{543}{\underline{\text{transportation}}}$ on a

$\underline{\text{multi-national}}$ basis in $\underline{\text{1969}}$."

Result: 3 works retrieved -

OFFICIAL AIRLINE GUIDE
WORLD ALMANAC
YEARBOOK OF INTERNATIONAL ORGANIZATIONS

7. Question: Can my son get into the University of California at Los Angeles with less than a 'B' average?

Handle: UCLA

Channel entry term:	corporate bodies	(433)
Service required:	discusses	439
Qualifier:	proper-named	434
Qualifier (subcol.):	education	541
Special control:	USA	558
Special control:	1968 recency	644

Search specification: "Required: a work that $\underset{439}{\underline{\text{discusses}}}$ $\underset{434}{\underline{\text{proper-}}}$ $\underline{\text{named}}$ $\underset{(433)}{\underline{\text{corporate bodies}}}$ $\underset{558}{\underline{\text{(U.S.)}}}$ concerned with $\underset{541}{\underline{\text{education}}}$. Must be no less recent than $\underset{644}{\underline{\text{1968}}}$."

Result: 10 works retrieved -

BRITANNICA BOOK OF THE YEAR
WORLD ALMANAC
CONGRESSIONAL QUARTERLY
AMERICAN UNIVERSITIES AND COLLEGES
STATEMAN'S YEARBOOK
EUROPA
YEARBOOK OF INTERNATIONAL ORGANIZATIONS
BOOK OF THE STATES
INTERNATIONAL ENCYCLOPEDIA OF THE SOCIAL SCIENCES
COLLIERS ENCYCLOPEDIA

8. Question: Who invented the zipper?

Handle: ZIPPER

Channel entry term	products	(357)
Service required:	discusses	366
Qualifier (subcol.):	engineering	533
Qualifier (time span):	20th Century	669

Search specification: "Required: a work that $\underset{366}{\underline{\text{discusses}}}$ the $\underset{533}{\underline{\text{engineering}}}$ of $\underset{669}{\underline{\text{20th Century}}}$ $\underset{(357)}{\underline{\text{products}}}$."

Result: 4 works retrieved - (next page)

(Results of retrieval #8, preceding page)

HARPER'S ENCYCLOPEDIA OF SCIENCE
NEW CATHOLIC ENCYCLOPEDIA
ADAMS. DICTIONARY OF AMERICAN HISTORY
COLLIERS ENCYCLOPEDIA

9. Question: Where is the American painting *Dover Baby* located?

Handle: *DOVER BABY*

Channel entry term:	art works	(401)
Service required:	locates	408
Qualifier:	proper-named	402
Qualifier (subcol.):	plastic arts	540
Special control:	U.S.A.	558

Search specification: "Required: a work that $\underset{408}{\underline{\text{locates}}}$ $\underset{402}{\underline{\text{proper-named}}}$ $\underset{(401)}{\underline{\text{art works}}}$ ($\underset{540}{\underline{\text{plastic arts}}}$) in the $\underset{558}{\underline{\text{United States}}}$."

Result: 5 works retrieved -

MONRO. INDEX TO REPRODUCTIONS OF AMERICAN PAINTINGS
GARDNER. ART THROUGH THE AGES
FLETCHER. HISTORY OF ARCHITECTURE
NEW CATHOLIC ENCYCLOPEDIA
ENCYCLOPEDIA OF WORLD ART

10. Question: Where can I get information on the American Historical Society?

Handle: AMERICAN HISTORICAL SOCIETY

Channel entry term:	corporate body	(433)
Service required:	discusses	439
Qualifier:	real	436
Qualifier:	proper-named	434
Qualifier:	non-profit	447
Qualifier (subcol.):	history	534
Special control:	U.S.A	558

Search specification: (next page)

(Search specification for #10, preceding page)

"Required: a work that $\underset{439}{\underline{\text{discusses}}}$ $\underset{436}{\underline{\text{real}}}$, $\underset{434}{\underline{\text{proper-named}}}$, $\underset{447}{\underline{\text{non-profit}}}$ $\underset{(433)}{\underline{\text{corporate bodies}}}$ $\underset{558}{\underline{\text{(U.S.)}}}$ concerned with $\underset{534}{\underline{\text{history}}}$."

Result: 9 works retrieved -

ENCYCLOPEDIA OF ASSOCIATIONS
RESEARCH CENTERS DIRECTORY
NEW RESEARCH CENTERS
WORLD OF LEARNING
FOUNDATIONS DIRECTORY
YEARBOOK OF INTERNATIONAL ORGANIZATIONS
NEW CATHOLIC ENCYCLOPEDIA
THE JEWISH ENCYCLOPEDIA
COLLIERS ENCYCLOPEDIA

11. Question: How many heartbeats are there, typically, in a human lifetime of - say - 70 years?

Handle: HEARTBEATS

Channel entry term:	natural processes	(233)
Service required:	discusses	238
Qualifier (subcol.):	medicine	520

Search specification: "Required: a work that $\underset{238}{\underline{\text{discusses}}}$ $\underset{520}{\underline{\text{medical}}}$ $\underset{(233)}{\underline{\text{natural processes}}}$."

Result: 9 works retrieved -

BOOK OF HEALTH
HARPER'S ENCYCLOPEDIA OF SCIENCE
DICTIONARY OF PSYCHOLOGICAL AND PSYCHOANALYTICAL TERMS
WORLD ALMANAC
NEW CATHOLIC ENCYCLOPEDIA
MCGRAW-HILL ENCYCLOPEDIA OF SCIENCE AND TECH
COLLIERS ENCYCLOPEDIA
COLUMBIA ENCYCLOPEDIA

12. Question: What is the origin of the term "screaming meemies?"

Handle: SCREAMING MEEMIES

Channel entry term:	words	(201)
Service required:	etymology	204
Qualifier:	slang	208

Search specification: "Required: a work that gives the $\underset{204}{\underline{\text{etymology}}}$ of $\underset{208}{\underline{\text{slang}}}$ $\underset{(201)}{\underline{\text{words}}}$."

Result: 6 works retrieved -

MATHEWS. DICTIONARY OF AMERICANISMS
WENTWORTH. DICTIONARY OF AMERICAN SLANG
WEBSTER'S NEW INTERNATIONAL DICTIONARY, II
WEBSTER'S NEW INTERNATIONAL DICTIONARY, III
OXFORD ENGLISH DICTIONARY
RANDOM HOUSE DICTIONARY

13. Question: I've heard that 1859 was a banner year for English literature. Can you tell me some of the major works published then?

Handle: 1859

Channel entry point:	year	464
Qualifier (subcol.):	literature	536
Qualifier (time span):	19th Century	656
Special control:	UK/Commonwealth	560

Search specification: "Required: a work that gives access by $\underset{464}{\underline{\text{year}}}$ to information about $\underset{560}{\underline{\text{English}}}$ $\underset{536}{\underline{\text{literature}}}$ of the $\underset{656}{\underline{\text{19th Century}}}$."

Result: 3 works retrieved -

THRALL & HIBBARD. HANDBOOK TO LITERATURE
LANGER. ENCYCLOPEDIA OF WORLD HISTORY
WORLD ALMANAC

14. Question: Do you suppose I could find a photograph of Thomas Pynchon, the American novelist?

Handle: THOMAS PYNCHON

Channel entry term:	persons	(333)
Qualifier:	proper-named	334
Qualifier:	real	339
Qualifier:	individual	335
Qualifier (subcol.):	literature	536
Special service:	portraits	607
Special control:	U.S.A.	558

Search specification: "Required: a work that has $\underset{607}{\underline{\text{portraits}}}$ of $\underset{334}{\underline{\text{proper-named}}}$, $\underset{339}{\underline{\text{real}}}$, $\underset{335}{\underline{\text{individual}}}$, $\underset{558}{\underline{\text{American}}}$ $\underset{536}{\underline{\text{literary}}}$ $\underset{(333)}{\underline{\text{figures}}}$."

Result: 6 works retrieved -

BRITANNICA BOOK OF THE YEAR
KUNITZ. 20TH CENTURY AUTHORS
NATIONAL CYCLOPEDIA OF AMERICAN BIOGRAPHY
NEW CATHOLIC ENCYCLOPEDIA
THE JEWISH ENCYCLOPEDIA
ENCYCLOPEDIA OF WORLD ART

15. Question: Has the zip code plan really made any difference in speeding up mail deliveries?

Handle: ZIP CODE PLAN

Channel entry term:	human procedures	(417)
Service required:	discusses	422
Service required:	chronicles	426
Qualifier (subcol.):	communications	544
Special control:	U.S.A.	558

Search specification: "Required: a work that discusses a $\underset{(417)}{\underline{\text{human procedure}}}$ bearing on $\underset{544}{\underline{\text{communications}}}$ in the $\underset{558}{\underline{\text{U.S.A.}}}$; it should also $\underset{426}{\underline{\text{chronicle}}}$ it as a newsworthy development."

(Result of search specification #15, preceding page)

1 work retrieved -

CONGRESSIONAL QUARTERLY

16. Question: What is Wisconsin's most valuable crop?

Handle: WISCONSIN

Channel entry term:	places	(301)
Qualifier:	real	304
Qualifier:	proper-named	302
Qualifier (subcol.):	agriculture	527
Special control:	U.S.A.	558
Special control:	1969 recency	643

Search specification: "Required: a work that gives $\underset{527}{\underline{\text{agricultural}}}$ information about a $\underset{304}{\underline{\text{real}}}$, $\underset{302}{\underline{\text{proper-named}}}$ $\underset{(301)}{\underline{\text{place}}}$ in the United States."

Result: 9 works retrieved -

BRITANNICA BOOK OF THE YEAR
WORLD ALMANAC
FACTS ON FILE
KEESING'S CONTEMPORARY ARCHIVES
N.Y. TIMES INDEX
CONGRESSIONAL QUARTERLY
WORLD OF LEARNING
YEARBOOK OF INTERNATIONAL ORGANIZATIONS
OFFICIAL CONGRESSIONAL DIRECTORY

17. Question: What country is the leading producer of beryl ore?

Handle: BERYL ORE

Channel entry term:	non-living objects	(249)
Service required:	locates	259
Qualifier:	common-named	251

Search specification: "Required: a work that gives $\underset{259}{\underline{\text{locations}}}$ of

(Search specification for #17, preceding page, cont.)

'$\underset{251}{\underline{\text{common-named}}}$ $\underset{(249)}{\underline{\text{non-living objects}}}$.'"

Result: 3 works retrieved -

WORLD ALMANAC
POOR'S REGISTER
COLLIERS ENCYCLOPEDIA

18. Question: Could you get me a summary of the Freedom of Information Act?

Handle: FREEDOM OF INFORMATION ACT

Channel entry term:	laws	519*
Service required:	discusses	506
Qualifier:	proper-named	502

Search specification: "Required: a work that $\underset{506}{\underline{\text{discusses}}}$ $\underset{502}{\underline{\text{proper-named}}}$ $\underset{519}{\underline{\text{laws}}}$." *(required in this case (see Index))

Result: 9 works retrieved -

OXFORD CLASSICAL DICTIONARY
BLACK'S LAW DICTIONARY
NEW CATHOLIC ENCYLCOPEDIA
HASTINGS. ENCYCLOPEDIA OF RELIGION AND ETHICS
ENCYCLOPEDIA OF PHILOSOPHY
INTERNATIONENCYCLOPEDIA OF THE SOCIAL SCIENCES
ADAMS. DICTIONARY OF AMERICAN HISTORY
COLLIERS ENCYCLOPEDIA
COLUMBIA ENCYCLOPEDIA

19. Question: Who won the World Series in 1963?

Handle: WORLD SERIES

Channel entry term:	events	(449)
Service required:	chronicles	459

(Terms for question #19, cont.)

Qualifier:	proper-named	450
Qualifier (subcol.):	sports	524
Qualifier (time span):	1961-1965	663

Search specification: "Required: a work that $\underset{459}{\underline{\text{chronicles}}}$ $\underset{450}{\underline{\text{proper-named}}}$ $\underset{524}{\underline{\text{sports}}}$ $\underset{(449)}{\underline{\text{events}}}$ in the $\underset{663}{\underline{\text{first part of the '60s}}}$."

Result: 3 works retrieved -

LANGER. ENCYCLOPEDIA OF WORLD HISTORY
WORLD ALMANAC
N.Y. TIMES INDEX

20. Question: I've heard quite a bit about "documentation" in the last three or four years. How does it relate to library science?

Handle: LIBRARY SCIENCE

Channel entry term:	fields	(217)
Service required:	discusses	222
Qualifier (subcol.):	librarianship	542
Qualifier (time span):	1967	645
Special control:	1967 recency	665

Search specification: "Required, a $\underset{665}{\underline{\text{recent (1967)}}}$ work that $\underset{222}{\underline{\text{discusses}}}$ $\underset{645}{\underline{\text{recent (1967) developments}}}$ in the $\underset{(217)}{\underline{\text{field}}}$ of $\underset{542}{\underline{\text{library science}}}$."

Result: 5 works retrieved -

BRITANNICA BOOK OF THE YEAR
INTERNATIONAL ENCYCLOPEDIA OF SOCIAL SCIENCES
MCGRAW-HILL ENCYCLOPEDIA OF SCIENCE AND TECH.
KIRK-OTHMER ENCYCLOPEDIA OF CHEMICAL TERMINOLOGY
COLLIERS ENCYCLOPEDIA